SLV-GA30/GA50/GA66/GA70K/GA77K/ GF80/GF90K/GF99K/P66/PH99

RMT-V254/V254A

SERVICE MANUAL

Ver 1.0 1998.10

Photo: SLV-GF99K
RMT-V254

East European Model
SLV-P66/PH99

ME Model
SLV-GA30/GA50/GA66/GF99K

Philippine Model
SLV-GA77K/GF99K

E Model
SLV-GA30/GA50/GA70K/ GA77K/GF80/GF90K/GF99K

Thai Model
SLV-GA30/GA50/GA70K/ GA77K/GF80/GF90K/GF99K

S MECHANISM

Refer to the SERVICE MANUAL of VHS MECHANICAL ADJUSTMENT Ⅵ for MECHANICAL ADJUSTMENTS. (9-921-647-11)

SPECIFICATIONS

System

Colour system
PAL, MESECAM, NTSC 3.58, NTSC 4.43
RF output signal
UHF channels 30 to 39
(B/G, D/K)
Aerial out
75-ohm asymmetrical aerial socket

Inputs and outputs

LINE-1 IN and LINE-2 IN
VIDEO IN, phono jack (1 each)
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO IN, phono jack (2 each)
Input level: 327 mVrms
Input impedance: more than 47 kilohms
LINE-1 OUT
LINE-2 OUT (SLV-GF99KME/PS only)
VIDEO OUT, phono jack (1 each)
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
AUDIO OUT, phono jack (2 each)
Standard output: 327 mVrms
Load impedance: 47 kilohms
Output impedance: less than 10 kilohms

General

Power requirements
110 – 240 V AC, 50/60 Hz
Power consumption
12 W
Operating temperature
5°C to 40°C
Storage temperature
–20°C to 60°C
Dimensions
Approx. 355 × 102 × 284 mm (w/h/d) including projecting parts and controls
Mass
Approx. 3.8 kg

Supplied accessories

Remote commander (1)
R6 (Size AA) batteries (2)
Microphone (1)
Aerial cable (1)
Audio/video cable (3-phono to 3-phono) (1)
Plug adaptor
(SLV-GF99KME and SLV-GF90KMJ only) (1)

Design and specifications are subject to change without notice.

VIDEO CASSETTE PLAYER

MICROFILM

SONY®

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

Abbreviation
SG: Gulf Model
PS: Pan Asia Model
TK: Thai Model
EE: East European Model
PL: Philippine Model

MODEL (SLV-)		GA30				GA50				P66	GA66	GA70K	
FEATURES		ME	SG	PS	TK	ME	SG	PS	TK	EE	ME	PS	TK
NTSC 3.58 REC/PB		X/X				O/O				O/O	O/O	O/O	
NTSC 4.43 REC/PB		X/O				O/O				O/O	O/O	O/O	
PAL REC/PB		X/O				O/O				O/O	O/O	O/O	
MESECAM REC/PB		X/O				O/O				O/O	O/O	O/O	
NTSC PB ON PAL TV		O				O				O	O	O	
REC MODE	NTSC	X				SP/EP		SP		SP	SP/EP	SP	
	PAL	X				SP/LP		SP		SP	SP/LP	SP	
PLAY MODE	NTSC	SP/LP/EP		SP		SP/LP/EP		SP		SP	SP/LP/EP	SP	
	PAL	SP/LP		SP		SP/LP		SP		SP	SP/LP	SP	
AUDIO SYSTEM		MONO				MONO				MONO	MONO	MONO	
KARAOKE		X				X				X	X	O	
KARAOKE PON		X				X				X	X	X	
SOUNDS IN STEREO		X				X				X	X	X	
SURROUND		X				X				X	O	X	
TAPE SPEED		O		X		O		X		X	O	X	
LINE IN (RCA PINS)	FRONT	X				X				X	3	X	
	REAR	X				2				2	3	2	
LINE OUT(RCA PINS)	FRONT	X				X				X	3	X	
	REAR	2				2				2	3	2	
RF IN/OUT		GK				GK				GK	GK	GK	
REMOTE COMMANDER		RMT-V254A				RMT-V254				RMT-V254	RMT-V254	RMT-V254	

MODEL (SLV-)		GA77K			GF80		PH99	GF90K		GF99K			
FEATURES		PS	TK	PL	PS	TK	EE	PS	TK	ME	PS	TK	PL
NTSC 3.58 REC/PB		O/O			O/O		O/O	O/O		O/O			
NTSC 4.43 REC/PB		O/O		X/X	O/O		O/O	O/O		O/O			X/X
PAL REC/PB		O/O		X/X	O/O		O/O	O/O		O/O			X/X
MESECAM REC/PB		O/O		X/X	O/O		O/O	O/O		O/O			X/X
NTSC PB ON PAL TV		O		X	O		O	O		O			X
REC MODE	NTSC	SP			SP		SP	SP		SP			SP/EP
	PAL	SP		X	SP		SP	SP		SP			X
PLAY MODE	NTSC	SP			SP		SP	SP		SP			SP/LP/EP
	PAL	SP		X	SP		SP	SP		SP			X
AUDIO SYSTEM		MONO			Hi-Fi		Hi-Fi	Hi-Fi		Hi-Fi			
KARAOKE		O			X		X	O		O			
KARAOKE PON		O			X		X	O		O			
SOUNDS IN STEREO		X			X		X	X		O			
SURROUND		O			X		X	X		O			
TAPE SPEED		X		O	X		X	X		X			O
LINE IN (RCA PINS)	FRONT	3			3		3	3		3			
	REAR	3			3		3	3		3			
LINE OUT(RCA PINS)	FRONT	3			X		X	X		3			
	REAR	3			3		3	3		3			
RF IN/OUT		GK		USA	GK		GK	GK		GK			USA
REMOTE COMMANDER		RMT-V254			RMT-V254		RMT-V254	RMT-V254		RMT-V254			

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SECTION 1
GENERAL

This section is extracted from instruction manual.(SLV-GF90K/GF99K model)

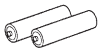
Step 1

Unpacking

Check that you have received the following items with the unit:

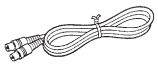
- Remote commander

- R6 (Size AA) batteries

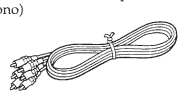


- Microphone

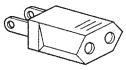
- Aerial cable



- Audio/video cable (3-phono to 3-phono)



- Plug adaptor (SLV-GF90KMJ and SLV-GF99KME only)



Checking your model name

The instructions in this manual are for the 4 models: SLV-GF99KME, GF99KPS, GF90KMJ and GF90KPS. Check your model number by looking at the rear panel of your unit. The SLV-GF99KME is the model used for illustration purposes. Any difference in operation is clearly indicated in the text, for example, "SLV-GF90KPS only."

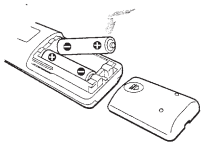
Step 2

Setting up the remote commander

Inserting the batteries

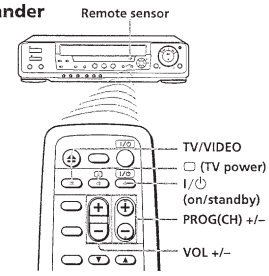
Insert two R6 (size AA) batteries by matching the + and – on the batteries to the diagram inside the battery compartment.

Insert the negative (–) end first, then push in and down until the positive (+) end clicks into position.



Using the remote commander

You can use this remote commander to operate the unit and a Sony TV. To operate this unit, point at the remote sensor on the unit. To operate the TV, point at the remote sensor on the TV. Buttons in the shaded area of the remote commander can be used to operate your Sony TV. If the TV does not have the ■ symbol near the remote sensor, this remote commander will not operate the TV.



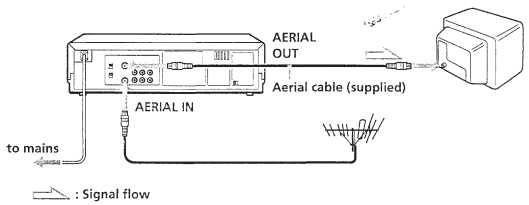
To	Press
Turn the TV to standby or active mode	I/⏻ (on/standby)
Turn on the TV power	▢ (TV power)
Increase (+) or decrease (–) the TV volume	VOL +/–
Change the TV programme position	PROG(CH) +/–
Select an input source of the TV either from aerial in or from line in	TV/VIDEO

Notes

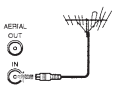
- With normal use, the batteries should last about three to six months.
- If you do not use the remote commander for an extended period of time, remove the batteries to avoid possible damage from battery leakage.
- Do not use a new battery with an old one.
- Do not use different types of batteries.

Step 3

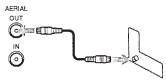
Connecting the unit



1 Disconnect the aerial cable from your TV and connect it to AERIAL IN on the rear panel of the unit.



2 Connect AERIAL OUT of the unit and the aerial input of your TV using the supplied aerial cable.



3 Connect the mains lead to the mains.

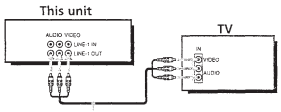
Use the supplied plug adaptor, if necessary, depending on the design of the mains (SLV-GF90KMJ and SLV-GF99KME only).

Additional connections

To a TV that has audio/video input jacks

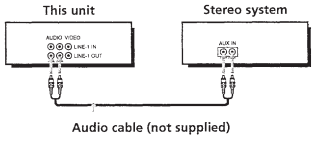
This additional connection improves picture and sound quality. Connect the TV as shown on the right.

If you want to use the Trinitron TV Synchro Play function (see page 14), this connection is necessary. (If your TV has two or more inputs, connect the audio/video cable to the VIDEO IN 1 jacks.)



To a stereo system

You can improve sound quality by connecting a stereo system as shown on the right.



Tip

- (SLV-GF99KME/PS only)
  You can also use LINE-2 OUT jacks on the front of the unit.

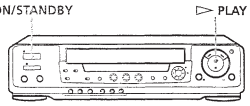
Note

- To listen to playback sounds in stereo and enjoy the Virtual Surround sound (SLV-GF99KME/PS only), you must use either of the connections above.

Step 4

Tuning your TV to the unit

If you have connected your unit to the TV using the audio/video cable, skip this step.



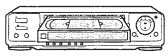
1 ON/STANDBY — Press ON/STANDBY to turn on the unit.

2 Turn on your TV and select a programme position for video playback.

Choose a channel between UHF 30 and 39 on the TV where there is no picture and no sound or only a steady rustling sound.

This channel will now be referred to as the video channel.

3 Insert a tape recorded in the colour system matching your TV into the cassette compartment.



The unit starts playing automatically if you insert a tape with its safety tab removed.

4 PLAY — Press ▷ PLAY on the unit.

5 Tune the TV until the video playback picture is clearly displayed on the TV screen.

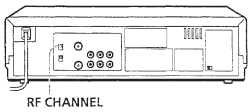
Refer to your TV manual for tuning instructions.

You have now tuned your TV to the unit. From now on, whenever you want to play a tape, set the TV to the video channel.

If the playback picture does not appear clearly, see "To obtain a clear playback picture" on page 9.

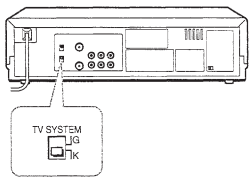
To obtain a clear playback picture

If the playback picture does not appear clearly in step 5 above, turn the RF CHANNEL screw on the rear panel of the unit with a screwdriver to a position where the TV clearly displays the playback picture.

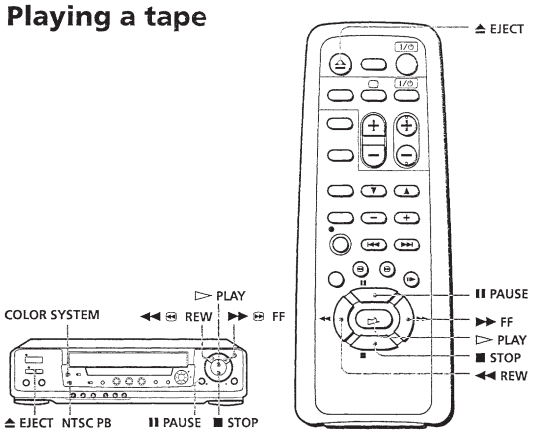


To select the TV system

For your TV to receive the correct signal from your unit, you must set the TV SYSTEM switch on the rear panel of the unit to either G (for system B/G) or K (for system D/K). If this switch is set to the wrong position, the sound will be distorted.

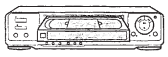


Playing a tape



1 Turn on your TV and set it to the video channel.

2 Insert a tape.



The unit turns on, and starts playing automatically if you insert a tape with its safety tab removed.

3 PLAY — Press ▷ PLAY.

When the tape reaches the end, it will rewind automatically.

Additional tasks

To	Press
Stop play	■ STOP
Pause play	II PAUSE
Resume play after pause	II PAUSE or ▷ PLAY
Fast-forward the tape	▶▶ FF (▶▶ ⊖ FF on the unit) during stop
Rewind the tape	◀◀ REW (◀◀ ⊖ REW on the unit) during stop
Eject the tape	▲ EJECT

To set the colour system

If streaks appear during playback, set COLOR SYSTEM on the unit to conform to the system that the tape was recorded in. (Normally set the switch to AUTO.)

If your tape was recorded in	Set COLOR SYSTEM to
PAL	PAL/MESECAM
NTSC	NTSC
MESECAM	PAL/MESECAM

To play an NTSC-recorded tape

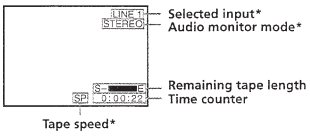
Set NTSC PB on the unit according to the colour system of your TV.

If your TV is	Set NTSC PB to
PAL	ON PAL TV
NTSC 4.43	NTSC 4.43
NTSC 3.58	NTSC 3.58

continued

To view the tape status on the screen

Press ON SCREEN DISPLAY on the unit. The following information appears on the TV screen.



* Appears for a few seconds when the ON SCREEN DISPLAY is pressed and when the mode is changed.

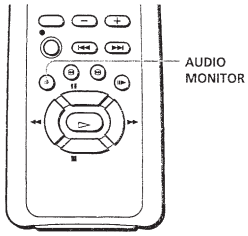
To turn the display off, press ON SCREEN DISPLAY again.

Notes

- You can eject a tape even when the power is off. When you press ⏏ EJECT, the unit turns on automatically. After ejecting the tape, the unit turns off again.
- When the pause mode lasts for more than approximately five minutes, the unit will automatically enter the playback mode.
- You can play back tapes recorded in the SP mode only.
- The counter resets to "0:00:00" whenever a tape is inserted.
- The counter stops counting when it comes to a portion with no recording.
- If a tape has portions recorded in both PAL and NTSC systems, the time counter reading will not be correct. This is due to the difference between the counting cycles of the two colour systems.
- Depending on your TV, the following may occur while playing an NTSC-recorded tape:
  - the picture is black and white,
  - the picture shakes,
  - no picture appears on the TV screen,
  - black streaks appear horizontally on the TV screen, and
  - the colour density increases or decreases.

Selecting the sound during playback

Press AUDIO MONITOR to select the sound you want. Each press of the button changes the indicator in the display window. When you play a tape recorded in stereo or with a bilingual sound track, the Hi-Fi indicator in the display window lights up.

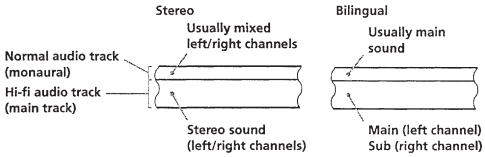


To listen to a		Press AUDIO MONITOR until the display window indicator shows
Stereo tape's	Bilingual tape's	
Stereo sound	Main and sub sounds	L/R
Left channel	Main sound	L
Right channel	Sub sound	R
Standard sound*1	Standard sound*2	No indication

*1 Usually the mixed sound of left and right channels (monaural)
*2 Usually the main sound (monaural)

How sound is recorded on a video tape

The unit records sound onto two separate tracks. Hi-fi audio is recorded onto the main track along with the picture. Monaural sound is recorded onto the normal audio track along the edge of the tape.



Notes

- To listen to playback sounds in stereo, you must use the AUDIO OUT connections.
- When you play back a tape recorded in monaural, the sound is heard in monaural regardless of the AUDIO MONITOR setting.
- You cannot select the sound to listen to while recording.

continued

Turning on the unit and TV, and starting playback automatically (Trinitron TV Synchro Play)

You can only use this function if your TV is made by Sony (Trinitron TV).

How to connect to use this function

Connect the unit and TV with the audio/video cable (see "To a TV that has audio/video input jacks" on page 7.) Be sure to connect the audio/video cable to the VIDEO IN 1 jacks on the TV if the TV has two inputs or more. The TV must be placed where it will respond to the remote commander while you are pointing it at the unit.

Operation

Make sure that the TV's power is in standby mode.

Press TRINITRON TV SYNCHRO PLAY and hold the remote commander in place for about two seconds.

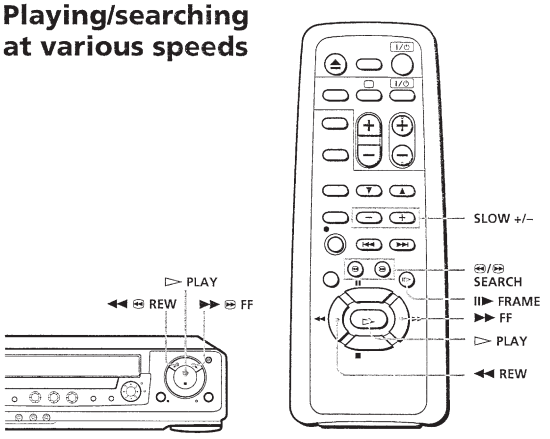
The unit and TV turn on, and the TV is set to the video channel. If there is a tape in the unit, playback starts automatically.

Notes

- If the Trinitron TV Synchro Play function does not work properly:
  - Wait a few moments, and press the button again.
  - Replace both of the batteries in the remote commander with new ones, and press the button again.

  Note that this function may not operate some Sony TVs because of the remote commander's signal limitations.
- Do not press TRINITRON TV SYNCHRO PLAY while playing back a video tape. If you do so, the TV's input source will momentarily switch to the TV's tuner.

Playing/searching at various speeds



Playback options	Operation
View the picture during fast-forward or rewind	During fast-forward, hold ▶▶ FF (▶▶ FF on the unit) down. During rewind, hold ◀◀ REW (◀◀ REW on the unit) down.
Play at high speed	• During playback or pause, press SEARCH or SEARCH . • During playback or pause, hold down ▶▶ FF (▶▶ FF on the unit) or ◀◀ REW (◀◀ REW on the unit). When you release the button, normal playback resumes.
Play in slow motion	During playback or pause, press SLOW+/–. Press the SLOW +/– buttons to change the speed.
Play frame by frame	During pause, press II▶ FRAME to advance the picture one frame. Hold the button down to play one frame each second.
Rewind and start play	During stop, hold ◀◀ REW on the unit down and press ▷ PLAY on the unit.

continued

To resume normal playback

Press ▷ PLAY.

Tips

- You can adjust the tracking just by rotating the PICTURE CONTROL dial or pressing ▼/▲ NORMAL/SLOW/STILL ADJUST while playing a tape.
- Adjust the picture using PICTURE CONTROL dial or ▼/▲ NORMAL/SLOW/STILL ADJUST if:
  - streaks appear while playing in slow motion
  - the picture shakes while pausing

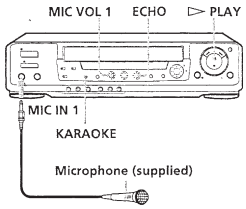
Notes

- Streaks or snow cannot be eliminated completely in the various playback operations, especially in the slow motion mode.
- The sound is muted during these operations.
- If you press II▶ FRAME during playback, playback continues at the normal speed but the sound is muted. Press ▷ PLAY to resume normal playback.
- On screen symbols may shake while playing or searching at various speeds.

Karaoke sing-along

You can sing along with a karaoke videotape played back on this unit.

You can also sing along with a TV broadcast or music played back on equipment connected to the LINE-1 IN jacks on the rear panel of the unit or LINE-2 IN jacks on the front panel of the unit. If you use an extra microphone (not supplied), you can sing duets.



Before you start...

- Turn on your TV and set it to the video channel.
- Connect the supplied microphone to the MIC IN 1 jack.
  To sing duets, connect the optional microphone to the MIC IN 2 jack.

Singing along with karaoke video tapes

1. Set KARAOKE to ON.
2. Insert a karaoke video tape.
   The unit turns on and starts playing automatically if you insert a tape with its safety tab removed.
3. Press ▷ PLAY (if playback didn't start in step 2).
   If you want to playback a specific song, see "Searching with the AMS function" on the next page.
4. Set the ON/OFF switch on the microphone to ON.
   Now you can enjoy playing karaoke.

continued

To adjust the microphone volume

Turn the MIC VOL 1 control for the microphone connected to MIC IN 1.

Turn the MIC VOL 2 control for the microphone connected to MIC IN 2.

Setting the MIC VOL 1 and/or MIC VOL 2 control(s) to the centre position provides the best microphone volume.

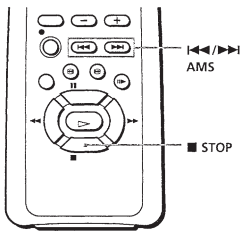
To control the echo effect

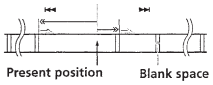
Turn the ECHO control. This controls both microphones' echo effect in the same way.

To get the best effect, adjust the microphone volume to a slightly higher level than the music volume.

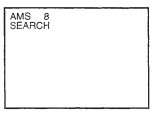
Searching with the AMS function

The AMS (Automatic Music Sensor) function is mainly for karaoke tapes. It searches for blank spaces (of at least four seconds) between recorded signals on the sound track of a tape. The unit can search up to 99 blank spaces ahead of or behind the current position.





1. Insert a tape into the unit.
2. Press I◀◀ / ▶▶I AMS repeatedly to specify how many blank spaces ahead or behind you want to search:
   - To search ahead, press ▶▶I AMS.
   - To search backwards, press I◀◀ AMS.

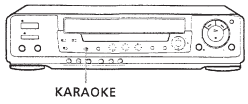
   The unit starts searching and the number of blank spaces on the TV screen counts down to zero. Playback starts automatically from that point.

To stop searching

Press ■ STOP.

Reducing the playback vocals (Karaoke Pon)

The Karaoke Pon function lets you use ordinary vocal music sources for Karaoke. You can sing to the music while the original singer's voices are reduced by this function. Note that you need to use hi-fi stereo music sources with this function.



Set KARAOKE to PON.

The singer's voice will be reduced.

To cancel Karaoke Pon

Set KARAOKE to ON or OFF.

Tips

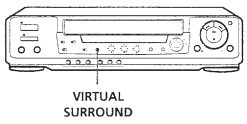
- When you sing along with music played back on equipment connected to the LINE-1 IN or LINE-2 IN jacks on the unit, set INPUT SELECT to LINE 1 or LINE 2, play the music source and follow steps 1 and 4 on page 17.
- If you connect your TV to the LINE-1 IN jacks, set the CONNECT LINE-1 switch on the rear of the unit to TV. (For details, see page 27)

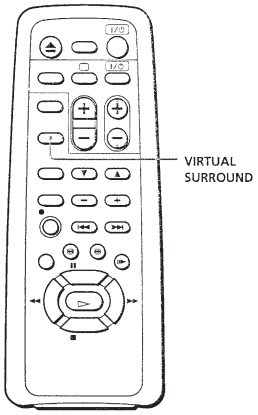
Notes

- If the sound is reproduced through a stereo amplifier, turn down the volume of amplifier before operation.
- If feedback occurs, turn down the microphone or TV volume, or move the microphone away from the speakers.
- Karaoke Pon does not work with the following tapes:
  - tapes on which different vocal sounds are recorded on the left and right channels, such as a duet;
  - tapes recorded monaurally; or
  - tapes on which sound sources are recorded with strong echo effects and chorus effects.
- The AMS may not work correctly when:
  - the tape quality is poor,
  - a song is very short (less than 40 seconds),
  - the interval between songs is very short (less than 6 seconds),
  - a tape has many blank spaces in a short time span such as dramas and dialogues,
  - a high level sound is recorded between songs or at the beginning of a song,
  - there are low level passages or passages without sound in a song,
  - narration is recorded at the beginning of a song,
  - fade-in or fade-out recording is made on the tape, or
  - AMS starts from the very beginning of the tape or near an interval between songs.

Enjoying the surround sound (Virtual Surround) (SLV-GF99KME/PS only)

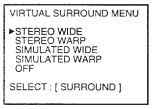
You can use the Virtual Surround function to give the surround sound effects to stereo sources, and the simulated stereo effects to monaural sources.





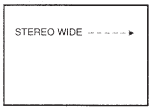
1 Press VIRTUAL SURROUND.

The VIRTUAL SURROUND MENU appears on the TV screen.



2 Press VIRTUAL SURROUND repeatedly to move the cursor (▶) to the effect you want (see the table on page 21).

Wait a few seconds to confirm the setting. The selected sound effect scrolls from left to right as shown on the right.



Virtual Surround

Effect	For
STEREO WIDE	A sound effect that spreads out over a large area (for stereo source)
STEREO WARP	A sound effect that totally envelopes you in sound (for stereo source)
SIMULATED WIDE	A simulated stereo wide effect (for monaural source)
SIMULATED WARP	A simulated stereo warp effect (for monaural source)
OFF	To cancel the Virtual Surround sound

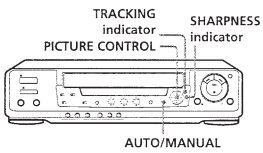
Notes

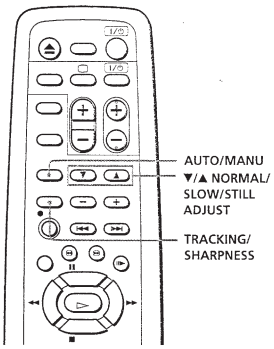
- This function is available only when the sound is reproduced on a stereo TV (or other stereo audio equipment) connected to the LINE-1 OUT or LINE-2 OUT (SLV-GF99KME/PS only) jacks. If the connected TV or other audio equipment is monaural or simulated stereo, you cannot get a clear effect.
- We recommend that you do not use the surround effect function of this unit and that of the connected TV (or other audio equipment) at the same time. If you do so, the function may not work properly because the effects overlap each other.

Adjusting the picture (Resolution Control)

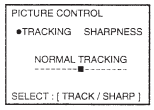
Adjusting the tracking and sharpness

Although the unit automatically adjusts the tracking and sharpness when playing a tape, distortion or noise may occur if the tape was recorded in poor condition. If so, manually adjust the tracking or sharpness.





1 While playing a tape, press the PICTURE CONTROL dial on the unit or TRACKING/SHARPNESS on the remote commander to display the PICTURE CONTROL menu.



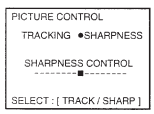
2 Press the PICTURE CONTROL dial on the unit or TRACKING/SHARPNESS on the remote commander to move the cursor (●) to TRACKING.

The TRACKING indicator flashes and the SHARPNESS indicator lights up.

3 Rotate the PICTURE CONTROL dial to the left or right or press ▼/▲ NORMAL/SLOW/STILL ADJUST on the remote commander to reduce the distortion.

4 Press the PICTURE CONTROL dial on the unit or TRACKING/SHARPNESS on the remote commander to move the cursor (●) to SHARPNESS.

The SHARPNESS indicator flashes.



5 Rotate the PICTURE CONTROL dial to the left or right or press ▼/▲ NORMAL/SLOW/STILL ADJUST on the remote commander to get a clearer picture.

Wait for several seconds until the menu disappears. The TRACKING and/or SHARPNESS indicator light(s) up to show the tracking and/or sharpness are/is manually adjusted.

To resume the automatic adjustment

Press AUTO/MANUAL on the unit or AUTO/MANU on the remote commander so that both of the TRACKING and SHARPNESS indicators turn off.

About OPC

OPC (Optimum Picture Control) automatically improves playback quality by adjusting the unit to the condition of the video heads and tape.

The OPC function automatically works on all types of tapes, including rental tapes and the tapes that were not recorded with OPC.

Tips

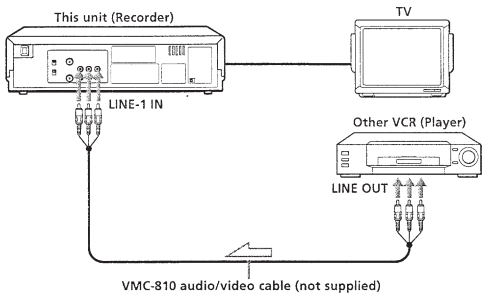
- You can adjust the tracking just by rotating the PICTURE CONTROL dial or pressing ▼/▲ NORMAL/SLOW/STILL ADJUST while playing a tape.
- Adjust the picture using PICTURE CONTROL dial or ▼/▲ NORMAL/SLOW/STILL ADJUST if:
  - streaks appear while playing in slow motion
  - the picture shakes while pausing

Notes

- The auto tracking function works automatically when you play back a tape just after inserting it.
- Sufficient picture quality may not be obtained when playing back tapes recorded on another VCR or tapes in poor condition.
- When a tape recorded with the copyguard system is played back, intermittent distortion may appear in the upper portion of the picture. However, this is not a malfunction of the unit.

Editing with another VCR

How to connect to record on this unit



Tips

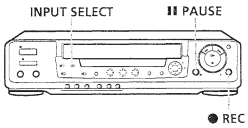
- If the other VCR is a monaural type and connected to the LINE-1 IN jacks on this unit, the sound is recorded only on the channel whose jack is connected to the audio plug. To record on both right and left channels, connect the audio plugs to AUDIO R/L jacks using the VMC-910MS audio/video cable (not supplied).
- You can also use the LINE-2 IN jacks on the front of the unit. If the other VCR is a monaural type, connect the audio plug to the AUDIO L (white) jack. The sound is recorded on both right and left channels. When connecting to the AUDIO R (red) jack, the sound is recorded only on the right channel.

Notes

- Make sure you connect the plugs to jacks of the same colour.
- If you connected this unit to both the LINE IN and LINE OUT jacks of the other VCR, select the input correctly to prevent a humming noise.
- Make sure you set the CONNECT LINE-1 switch to OTHERS.

Operation (when recording on this unit)

You can make a copy of a tape using this unit for recording or playback. The unit cannot record TV programmes directly since it does not have a TV tuner.



Before you start editing

- Turn on your TV and set it to the video channel.

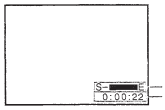
1 Set INPUT SELECT to LINE 1 or LINE 2.
2 Insert a source tape with its safety tab removed into the other (playback) VCR. Search for the point to start playback and set it to playback pause.
3 Insert a tape with its safety tab in place into this (recording) unit. Search for the point to start recording and press II PAUSE.
4 Press ● REC on this unit to set it to recording pause.
5 To start editing, press the II PAUSE buttons on both units at the same time.

To stop editing

Press the ■ STOP buttons on both units.

To check the remaining tape length

Press ON SCREEN DISPLAY. The white bar indicates the approximate length of the tape recording.



To turn the display off, press ON SCREEN DISPLAY again.

continued

To save a recording

To prevent accidental erasure, break off the safety tab as illustrated. To record on a tape again, cover the tab hole with adhesive tape.

Tips

- To edit more precisely, press the II PAUSE buttons on the units to release pause.
- To cut out unwanted scenes while editing, press II PAUSE on this unit when an unwanted scene begins. When that scene ends, press II PAUSE again to resume recording.

Note

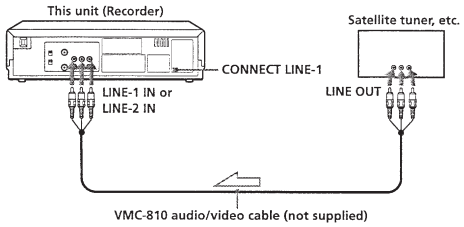
- You can record tapes only in SP mode.

Synchronised recording

The Synchronised Recording feature enables you to record from the connected equipment such as a satellite tuner, a cable TV decoder or a TV that has a timer function. Once you set the timer on the other equipment, the unit will start recording the programme synchronised with the timer.

How to connect to use this function

Connect the other equipment to the LINE-1 IN or LINE-2 IN jacks of this unit.



Setting the CONNECT LINE-1 switch

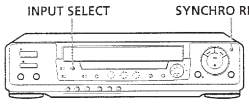
When you connect the other equipment to the LINE-1 IN jacks, set the CONNECT LINE-1 switch on the rear of the unit following the table below to allow better signal transmission to your TV.

If the unit is connected to	Set the CONNECT LINE-1 switch to
TV	TV
Satellite, cable TV decoder, etc.	OTHERS

continued

Synchronised recording (continued)

To prepare the Synchronised recording



1 Set the timer on the equipment to the time of the programme you want to record, then turn it off.
2 Insert a tape with its safety tab in place. Make sure the tape is longer than the total recording time.
3 Set INPUT SELECT to LINE 1 or LINE 2.
4 Hold SYNCHRO REC down for more than two seconds.
The SYNCHRO REC button lights up and the unit stands by for recording.

The unit automatically turns on and starts recording when it receives audio/video signals from the connected equipment.

To cancel the Synchronised recording

Press SYNCHRO REC so that the button's light turns off.

To stop recording

Press ■ STOP while recording.

The unit automatically stops recording when the tape reaches the end or when the other equipment stops transmitting the audio/video signals.

Notes

- Some TVs or other equipment automatically turn off in a certain time if you do not operate it after it turns on with the timer. In this case the Sychronised Recording also stops automatically.
- The Synchronised Recording starts and stops according to the signals from the connected equipment. Refer also to the instruction manual of the connected equipment for its timer function.
- You can record tapes only in SP mode.

Troubleshooting

If you have any questions or problems not covered below, please consult your nearest Sony service facility.

	Symptom	Remedy
Power	The ON/STANDBY switch does not function.	• Connect the mains lead securely.
	The power is turned on but the unit does not operate.	• Moisture condensation occurs. Turn the power off, unplug the mains lead and leave the unit to dry for over an hour.
	The unit enters standby mode or turns off automatically.	• The auto safety system is triggered to protect your tape and the unit's mechanism when there is something wrong with the tape or when the mechanism is overloaded. Press ON/STANDBY to restart the unit. If the unit does not work after pressing ON/STANDBY again, disconnect the mains lead from the mains. Wait for at least 15 seconds. Then reconnect mains, and press ON/STANDBY again. If the unit still does not work, please consult your nearest Sony service facility.
Playback	The playback picture does not appear on the TV screen.	• Make sure the TV is set to the video channel. If you are using a monitor, set it to video input.
	The picture is not clear.	• Adjust the tracking with the ▼/▲ NORMAL/SLOW/STILL ADJUST buttons. • Make sure the COLOR SYSTEM switch is set to the position corresponding to the colour system which the tape was recorded with. • The video heads are dirty (see the next page). Clean the video heads using the Sony T-25CLD, T-25CLW or E-25CLDR video head cleaning cassette. If these cleaning cassettes are not available in your area, have the heads cleaned at your nearest Sony service facility (a standard service charge will be required). Do not use a commercially available liquid type cleaning cassette, as it may damage the video heads. • The video heads may have to be replaced. Consult your local Sony service facility for more information.
	The picture rolls vertically during picture search.	• Adjust the vertical hold control on the TV or monitor.
	The picture has no sound.	• The tape is defective. • If you made A/V connections, check the audio cable connection.

continued

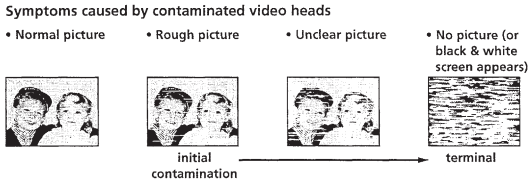
Troubleshooting (continued)

	Symptom	Remedy
Recording	The tape starts playing as soon as it is inserted.	• The safety tab has been removed. To record on this tape, cover the tab hole.
	The tape is ejected when you press ● REC.	• Check that the safety tab has not been removed.
	Nothing happens when you press ● REC.	• Make sure the tape is not at its end. • Select the correct source with the INPUT SELECT switch, LINE 1 or LINE 2.
Others	The microphone sound is distorted.	• The MIC VOL 1 or MIC VOL 2 control is set too high.
	A tape cannot be inserted.	• Check that a tape isn't already in the tape compartment.
	The remote commander does not function.	• Make sure you are pointing the remote commander at the remote sensor on the unit. • Replace all the batteries in the remote commander with new ones if they are weak.
	The unit needs to be cleaned.	• Clean the cabinet, panel, and controls with a dry soft cloth, or a soft cloth slightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzine.

Auto head cleaner

The unit incorporates an auto head cleaner which cleans the video heads when a tape is loaded or unloaded. When the heads are not sufficiently clean, even after a tape has been loaded/unloaded several times, use a video head cleaning cassette.

Symptoms caused by contaminated video heads



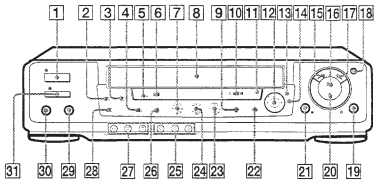
Sapphire tape cleaner

The unit incorporates a sapphire tape cleaner which cleans a video tape when it is loaded. This cleaner can prevent the video heads from contamination by removing dust or mold from a tape with the sapphire edge.

Index to parts and controls

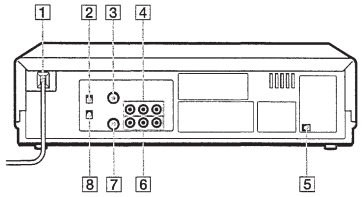
Refer to the pages indicated in parentheses ( ) for details.

Front panel



1 ON/STANDBY switch/indicator (8)
2 COLOR SYSTEM switch (11)
3 INPUT SELECT switch (25)
4 KARAOKE switch (17)
5 REC (recording) indicator
6 Tape operation indicator
7 MIC VOL 1 control (18)
8 Tape compartment
9 ON SCREEN DISPLAY button (12, 25)
10 HiFi/L/R indicators (13)
11 Remote sensor (5)
12 PICTURE CONTROL dial (22)
13 TRACKING indicator (22)
14 SHARPNESS indicator (22)
15 ◀◀ REW (rewind) button (11, 15)
16 ▷ PLAY button (10)
17 ▶▶ FF (fast-forward) button (11, 15)
18 SYNCHRO REC (record) button (28)
19 ● REC (record) button (25)
20 ■ STOP button (11)
21 ❚❚ PAUSE button (11)
22 AUTO/MANUAL button (23)
23 ECHO control (18)
24 MIC VOL 2 control (18)
25 LINE-2 OUT VIDEO/AUDIO L/R jacks (7) (SLV-GF99KME/PS only)
26 VIRTUAL SURROUND button (20) (SLV-GF99KME/PS only)
27 LINE-2 IN VIDEO/AUDIO L/R jacks (24)
28 NTSC PB switch (11)
29 MIC IN 2 jack (18)
30 MIC IN 1 jack (18)
31 ⏏ EJECT button (11)

Rear panel



1 Mains lead (6)

2 RF (Radio Frequency) CHANNEL screw (9)

3 AERIAL OUT connector (6)

4 LINE-1 IN AUDIO R/L/VIDEO jacks (24)

5 CONNECT LINE-1 switch (27)

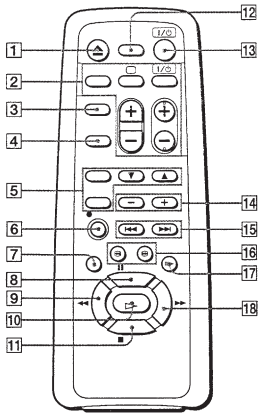
6 LINE-1 OUT AUDIO R/L/VIDEO jacks (7)

7 AERIAL IN connector (6)

8 TV SYSTEM switch (9)

continued

Remote commander



1 ⏏ EJECT button (11)

2 TV control buttons *(Only for TV)* (5)
TV/VIDEO
⏻ (TV power)
I/⏻ (on/standby)
VOL (volume) +/–
PROG (CH) +/–

3 TV/VIDEO button *(This button doesn't work with this unit.)*

4 VIRTUAL SURROUND button *(This button works only for SLV-GF99KME/PS.)* (20)

5 PICTURE CONTROL buttons
AUTO/MANU (23)
TRACKING/SHARPNESS (22)
▼/▲ NORMAL/SLOW/STILL ADJUST (22)

6 ● REC (record) button (25)

7 AUDIO MONITOR button (13)

8 ⏸ PAUSE button (11)

9 ◀◀ REW (rewind) button (11, 15)

10 ▷ PLAY button (10)

11 ■ STOP button (11)

12 TRINITRON TV SYNCHRO PLAY button (14)

13 I/⏻ (on/standby) switch (8)

14 SLOW +/– buttons (15)

15 ⏮/⏭ AMS (Automatic Music Sensor) buttons (18)

16 ⏪/⏩ SEARCH buttons (15)

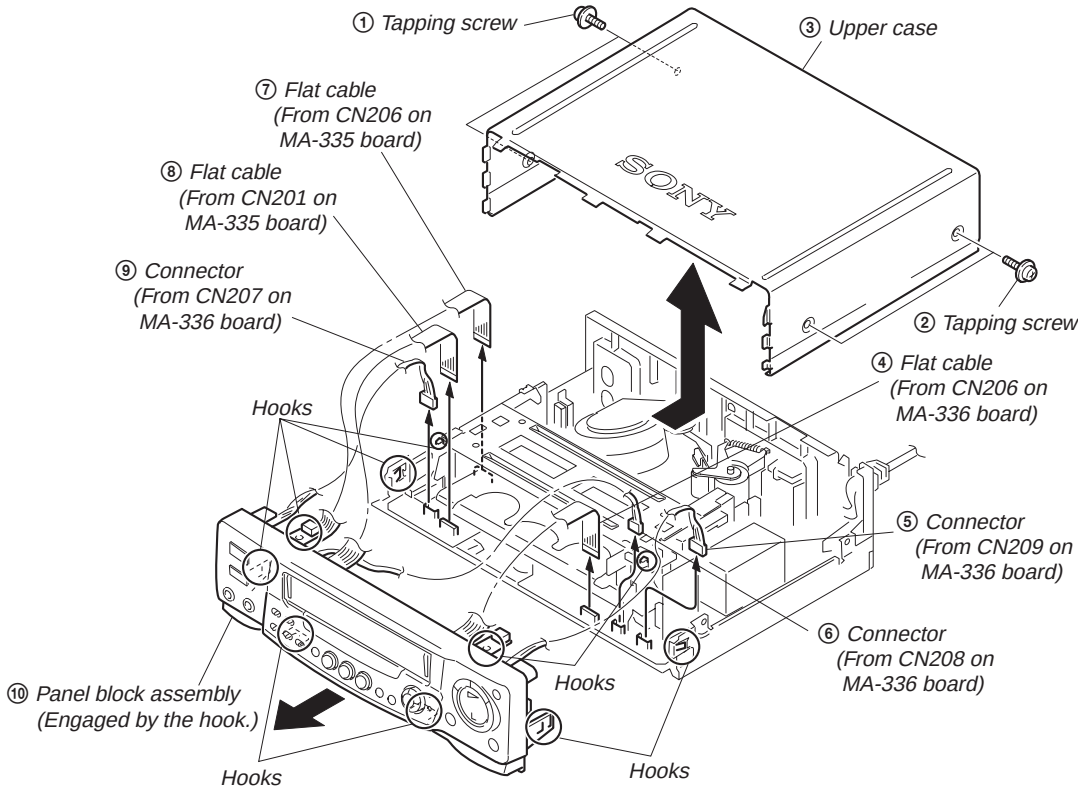
17 ⏸▶ FRAME button (15)

18 ▶▶ FF (fast-forward) button (11, 15)

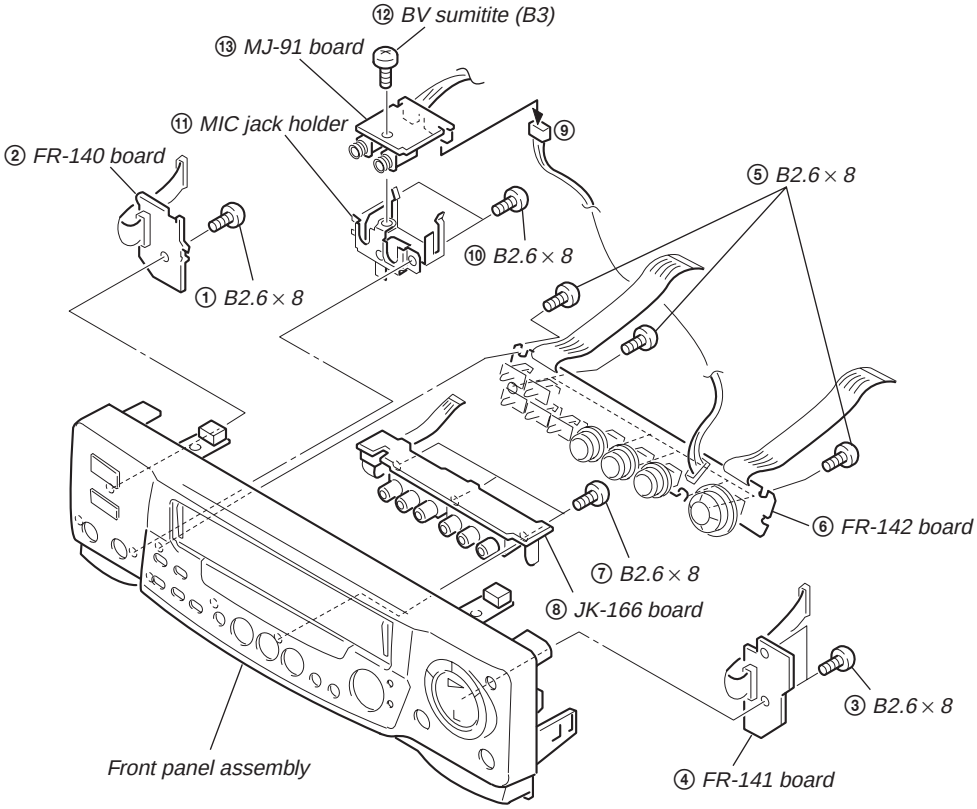
SECTION 2
DISASSEMBLY

NOTE: Follow the disassembly procedure in the numerical order given.

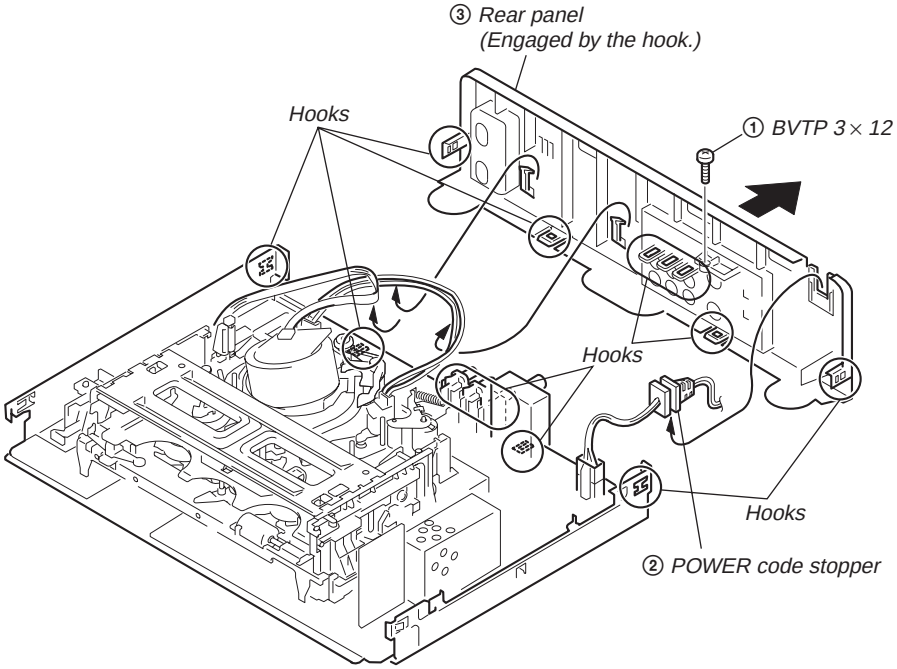
2-1. UPPER CASE, PANEL BLOCK ASSEMBLY


① Tapping screw
③ Upper case
⑦ Flat cable (From CN206 on MA-335 board)
⑧ Flat cable (From CN201 on MA-335 board)
⑨ Connector (From CN207 on MA-336 board)
② Tapping screw
④ Flat cable (From CN206 on MA-336 board)
Hooks
⑤ Connector (From CN209 on MA-336 board)
⑥ Connector (From CN208 on MA-336 board)
Hooks
⑩ Panel block assembly (Engaged by the hook.)
Hooks
Hooks

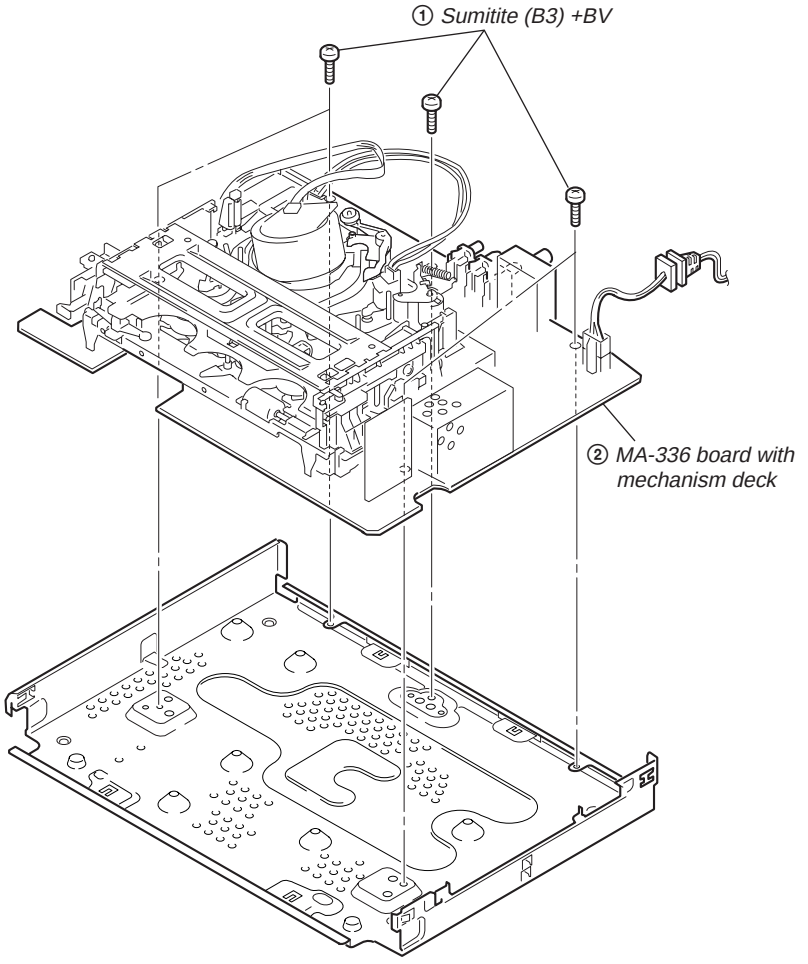
2-2. FR-140, 141, 142, JK-166, MJ-91 BOARDS



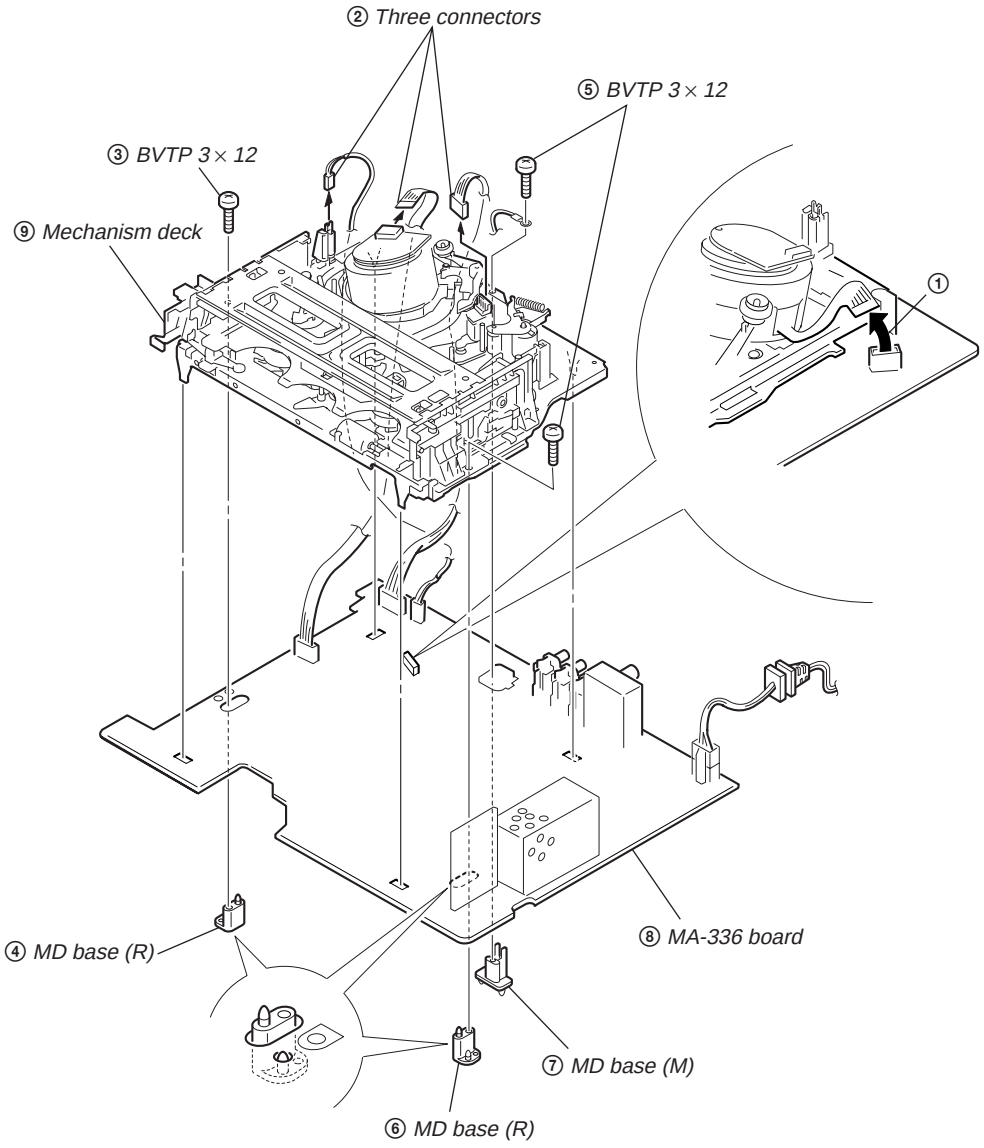
2-3. REAR PANEL



2-4. MA-336 BOARD



2-5. MECHANISM DECK



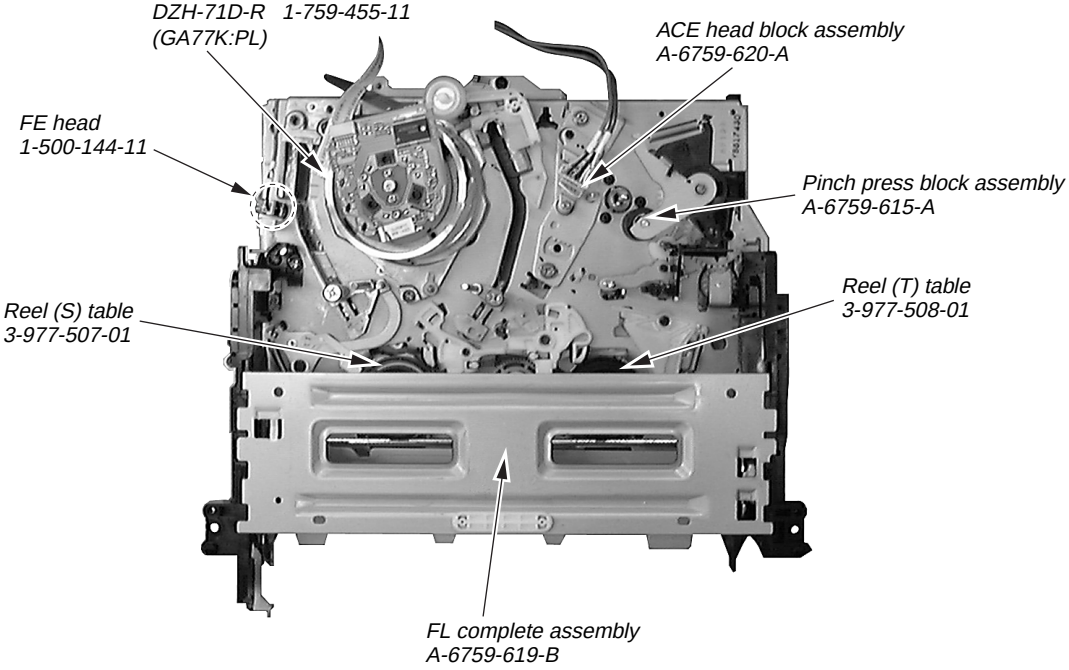
2-6. INTERNAL VIEWS

Abbreviation
SG: Gulf Model EE: East European Model
PS: Pan Asia Model PL: Philippine Model
TK: Thai Model

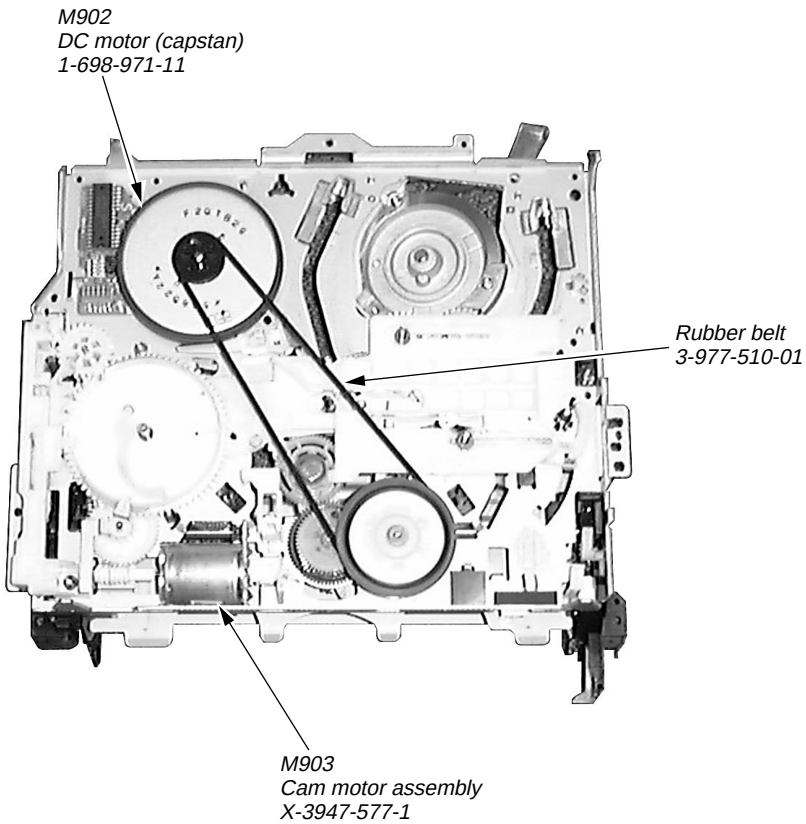
— Top View —

M901
Drum Assembly

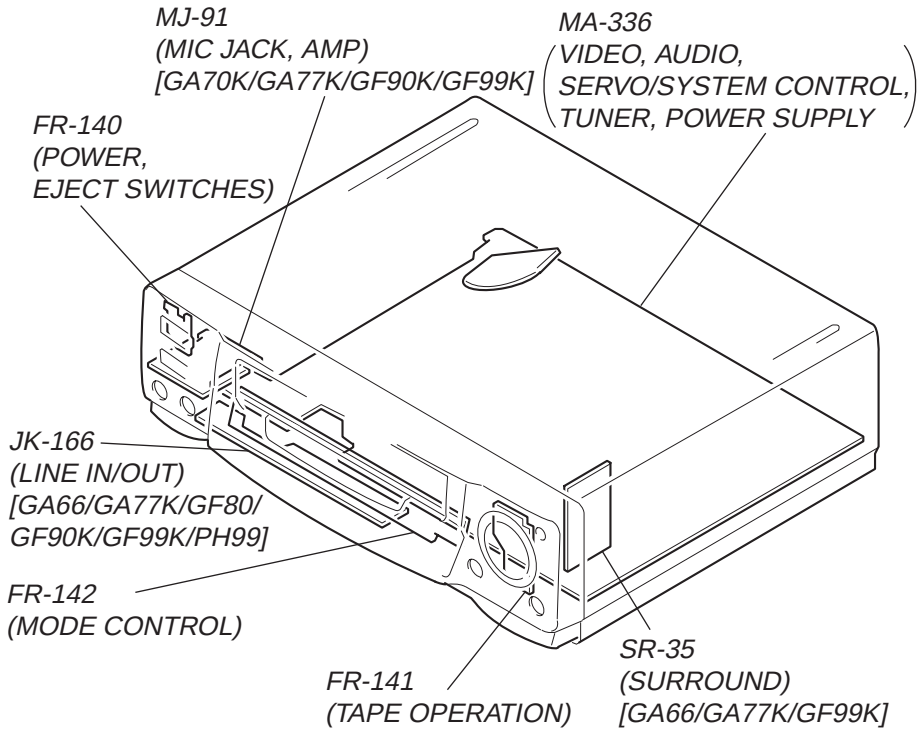
DZH-78A-R 1-759-183-11
(GA30:PS,TK/GA50:PS,TK/GA70K:PS,TK/GA77K:PS,TK/P66)
DZH-91A-R 1-759-449-11
(GF80:PS,TK/GF90K:PS,TK/GF99K:ME,PS,TK/PH99)
DZH-90A-R 1-759-451-11
(GF99K:PL)
DZH-89A-R 1-759-453-11
(GA30:SG,ME/GA50:SG,ME/GA66:ME)
DZH-71D-R 1-759-455-11
(GA77K:PL)



— Bottom View —

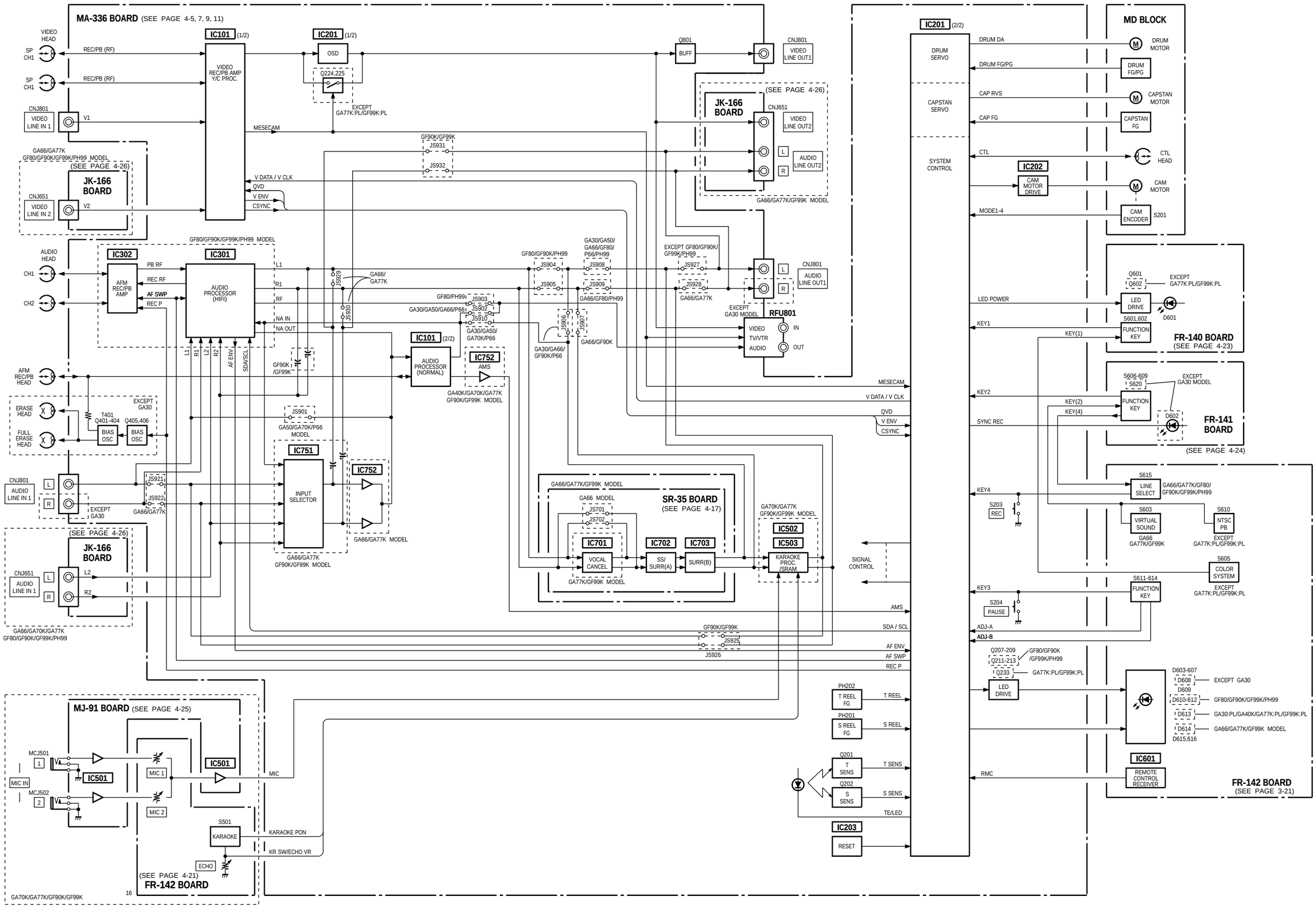


2-7. CIRCUIT BOARDS LOCATION

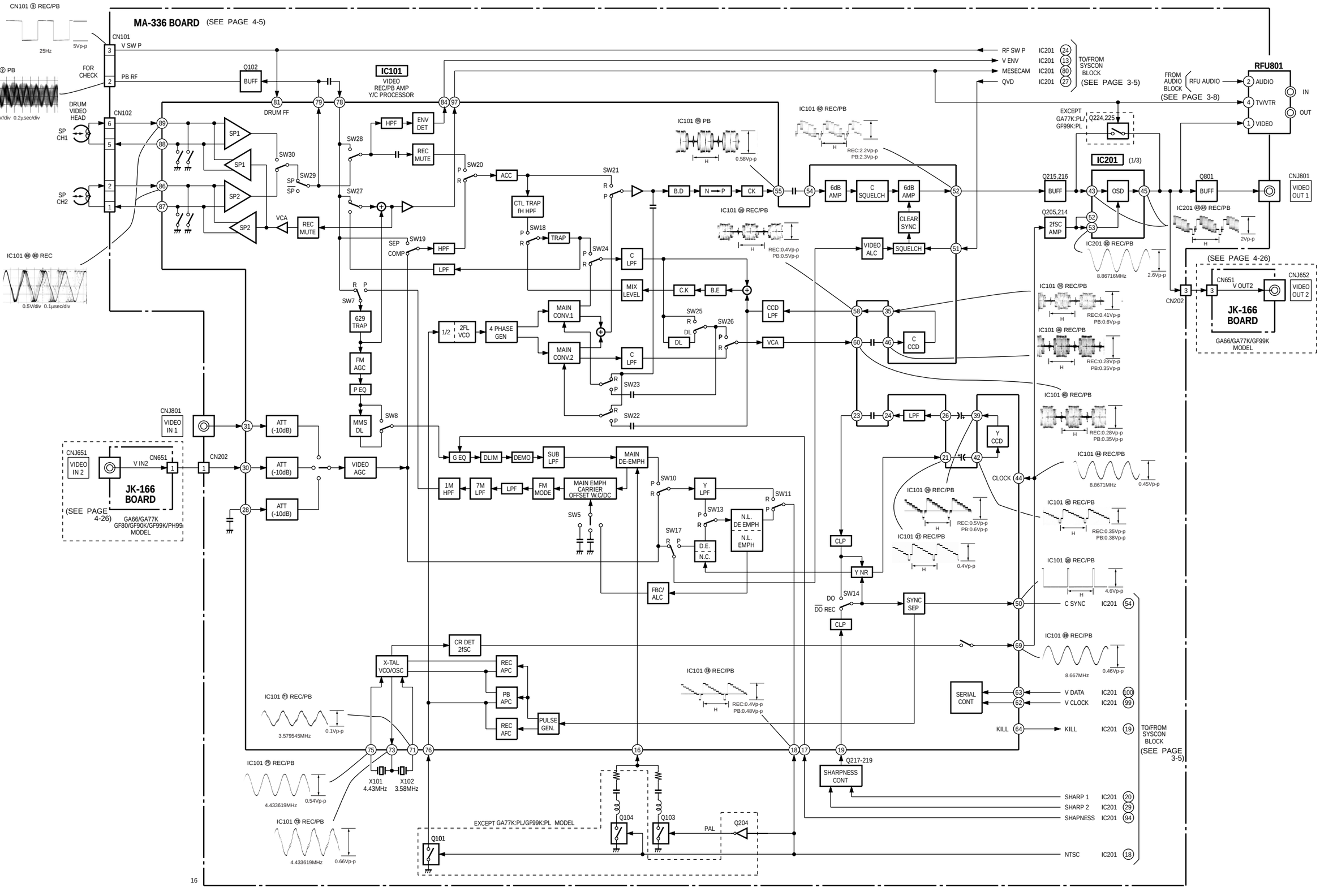


SECTION 3
BLOCK DIAGRAMS

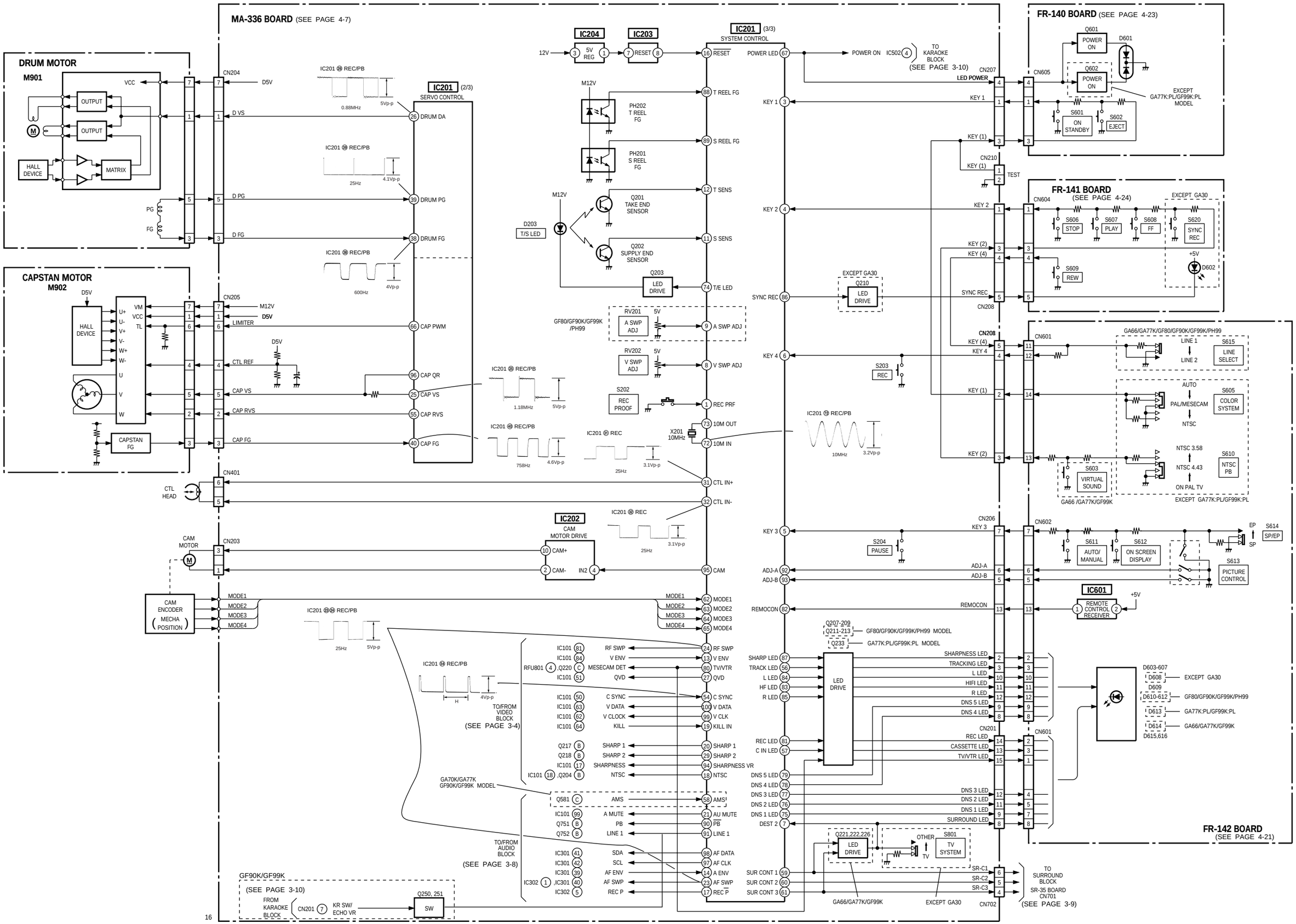
3-1. OVERALL BLOCK DIAGRAM



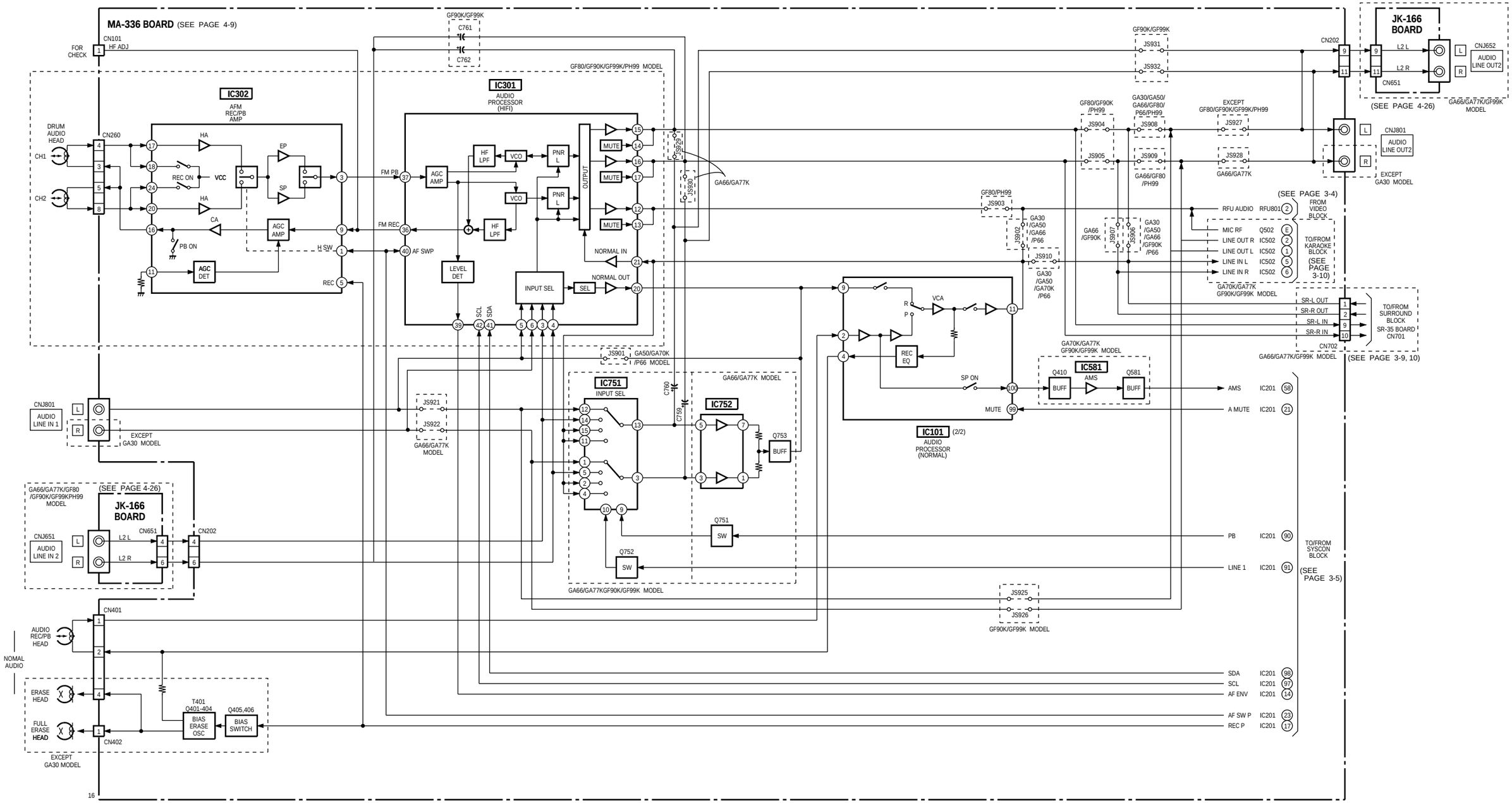
3-2. VIDEO BLOCK DIAGRAM



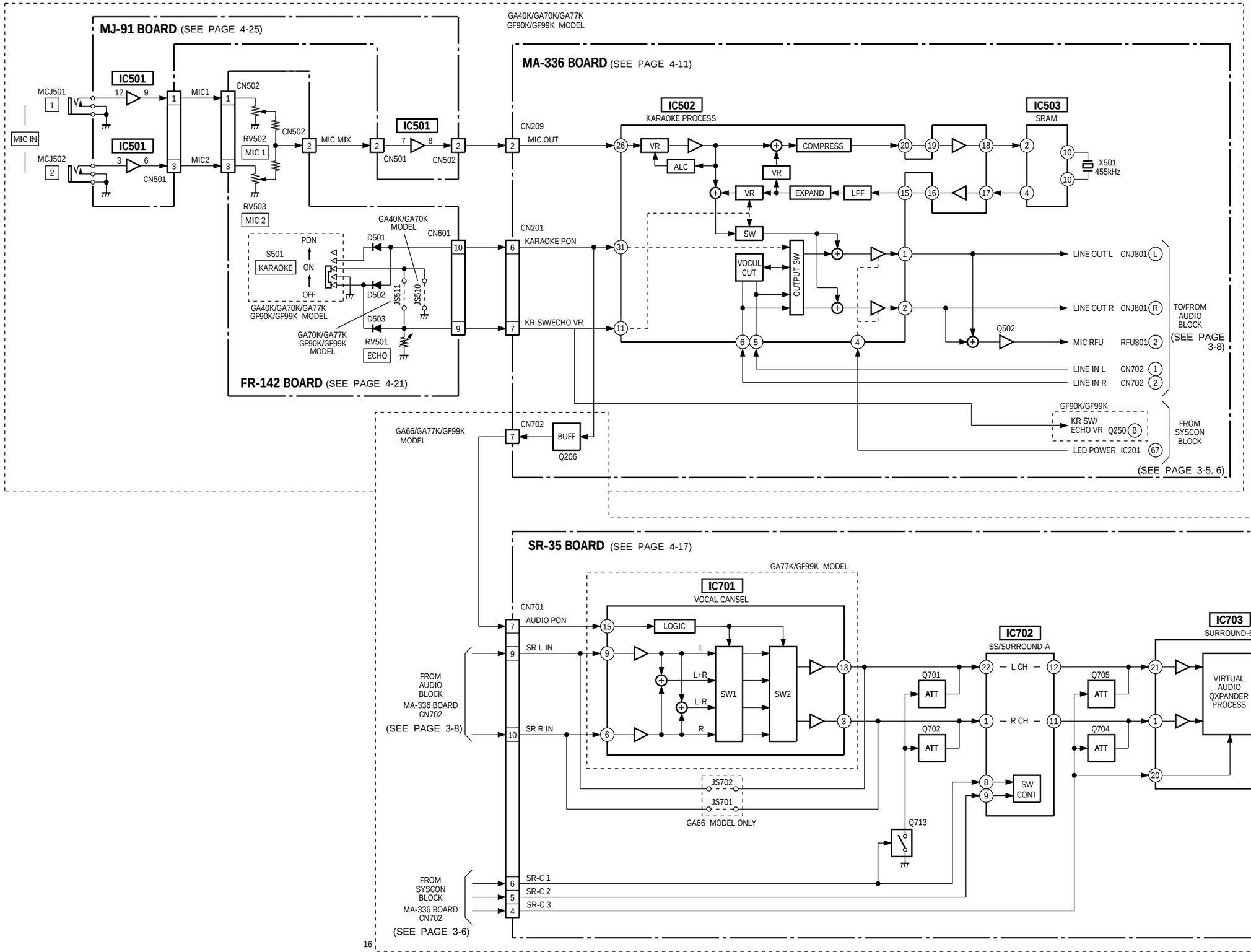
3-3. SERVO/SYSTEM CONTROL BLOCK DIAGRAM



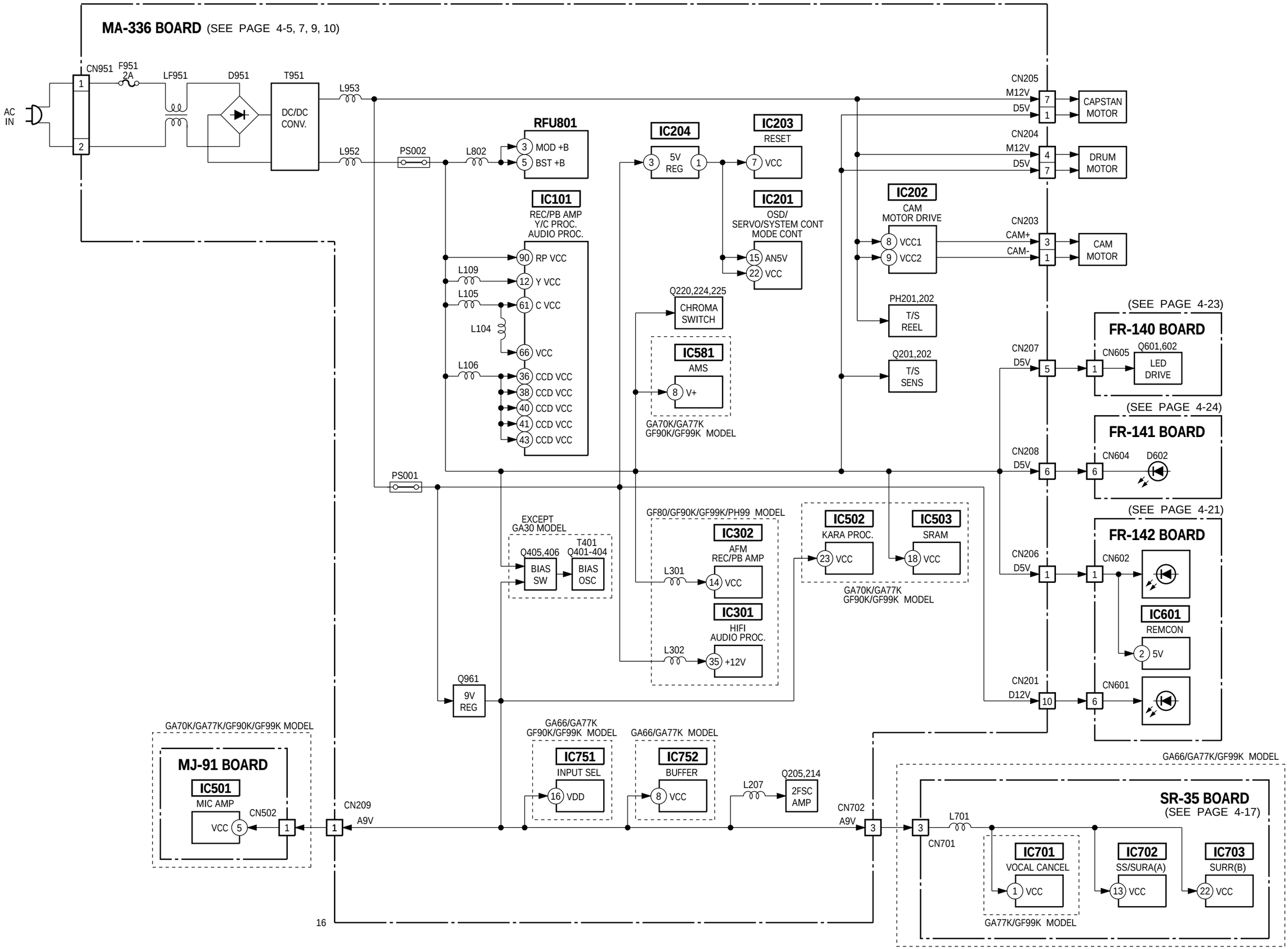
3-4. AUDIO BLOCK DIAGRAM



3-5. KARAOKE BLOCK DIAGRAM



3-6. POWER SUPPLY BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

- **For Printed Wiring Boards.**
- ▒▒▒: Pattern from the side which enables seeing.

Caution :	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Pattern face side: (Component Side)	parts on the parts face side seen from the parts face are indicated.

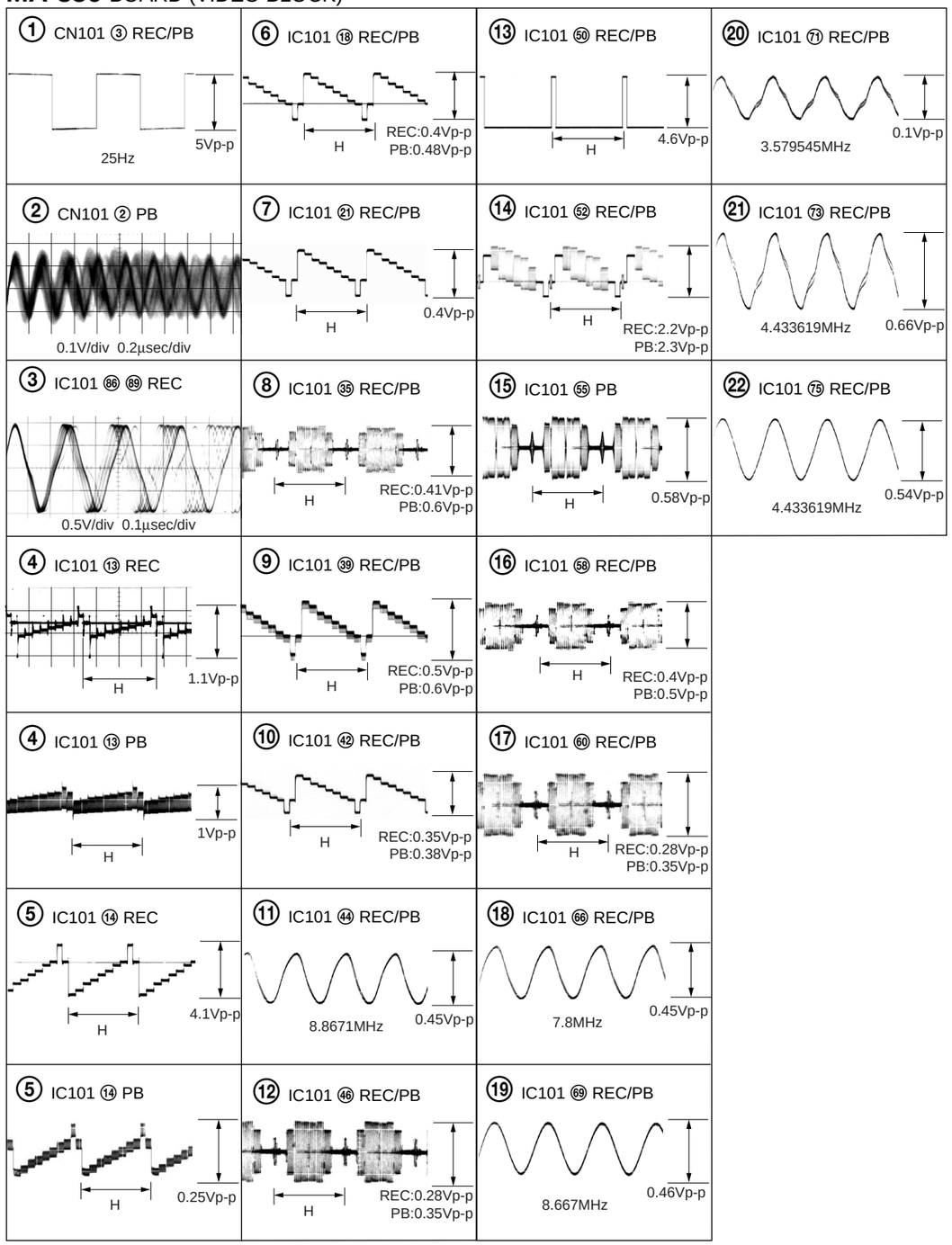
- **For Schematic Diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistor are in ohms, 1/4 W unless otherwise noted.
  Chip resistor are 1/10 W unless otherwise noted.
  kΩ: 1000 Ω, M Ω, : 1000 kΩ.
- All capacitors are in μF unless otherwise noted. pF : μμF. 50 V or less are not indicated except for electrolytics and tantalums.
- ▭: panel designation.
- △ : internal component.
- B+ : B+ Line.
- B− : B– Line.
- Circled numbers refer to waveforms.
- Readings are taken with a PAL color-bar signal input.
- Voltage are dc between ground and measurement points.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

When indicating parts by reference number, please include the board name.

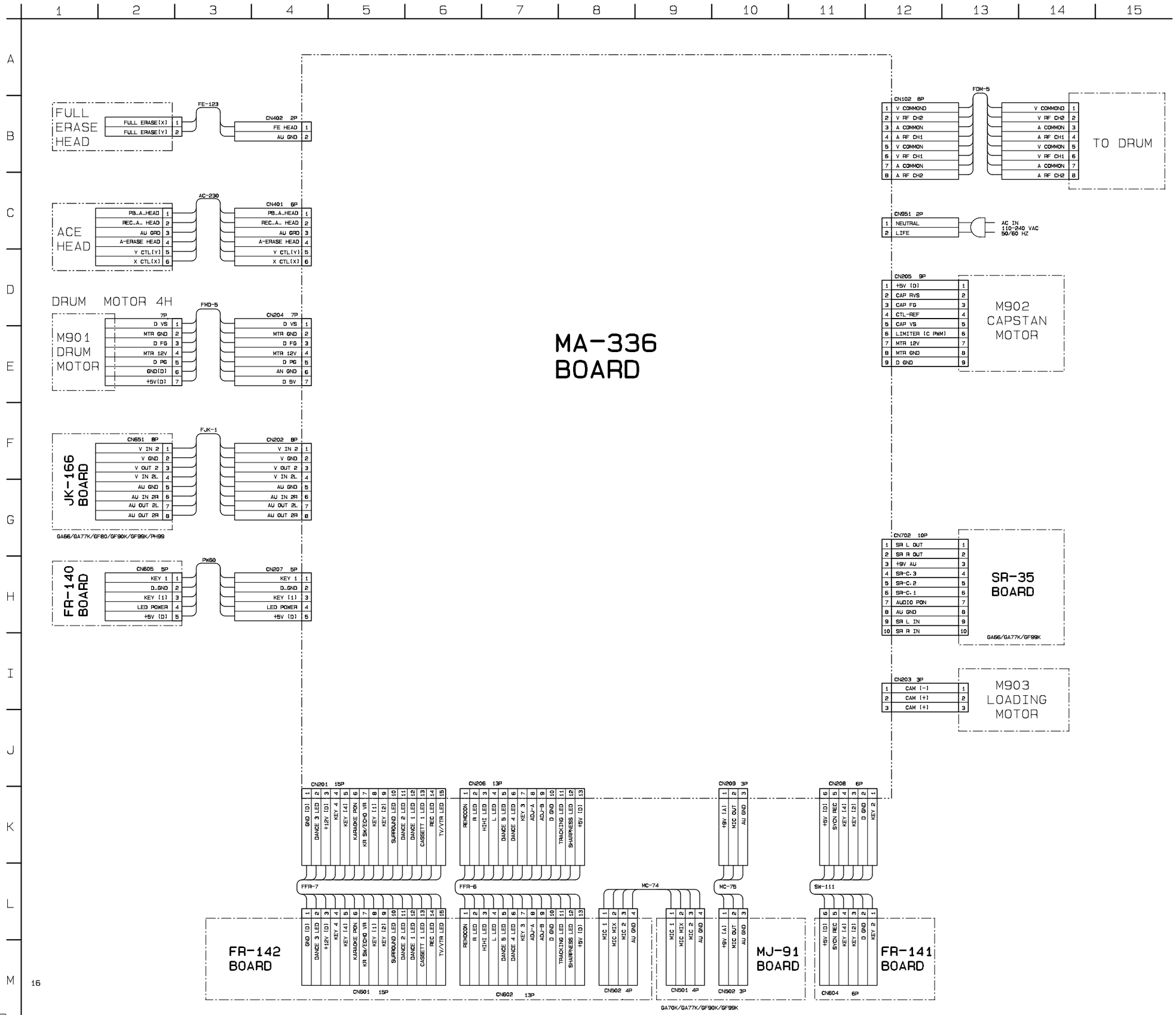
Abbreviation

SG: Gulf Model EE: East European Model
PS: Pan Asia Model PL: Philippine Model
TK: Thai Model

MA-336 BOARD (VIDEO BLOCK)



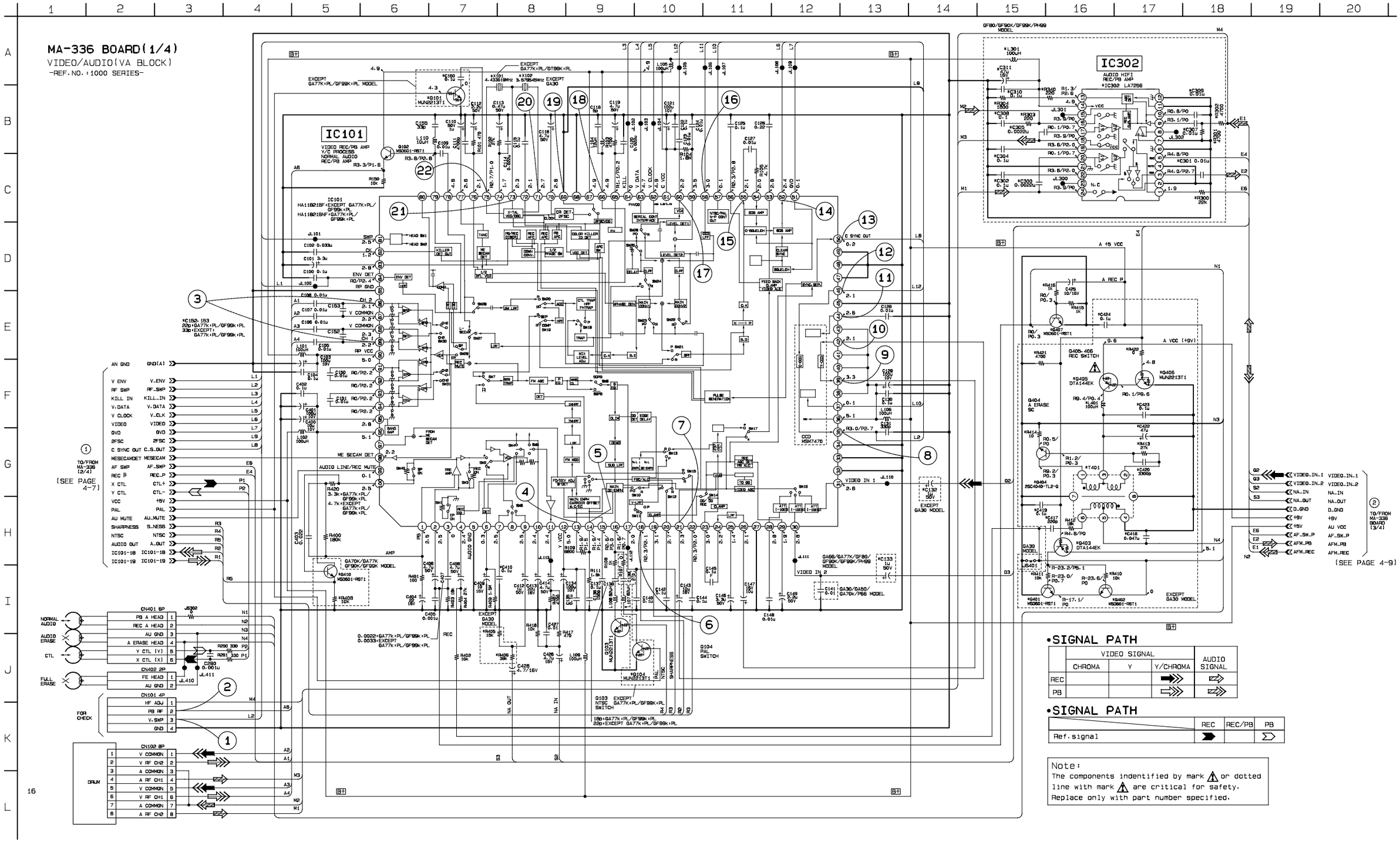
4-1. FRAME SCHEMATIC DIAGRAM



4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

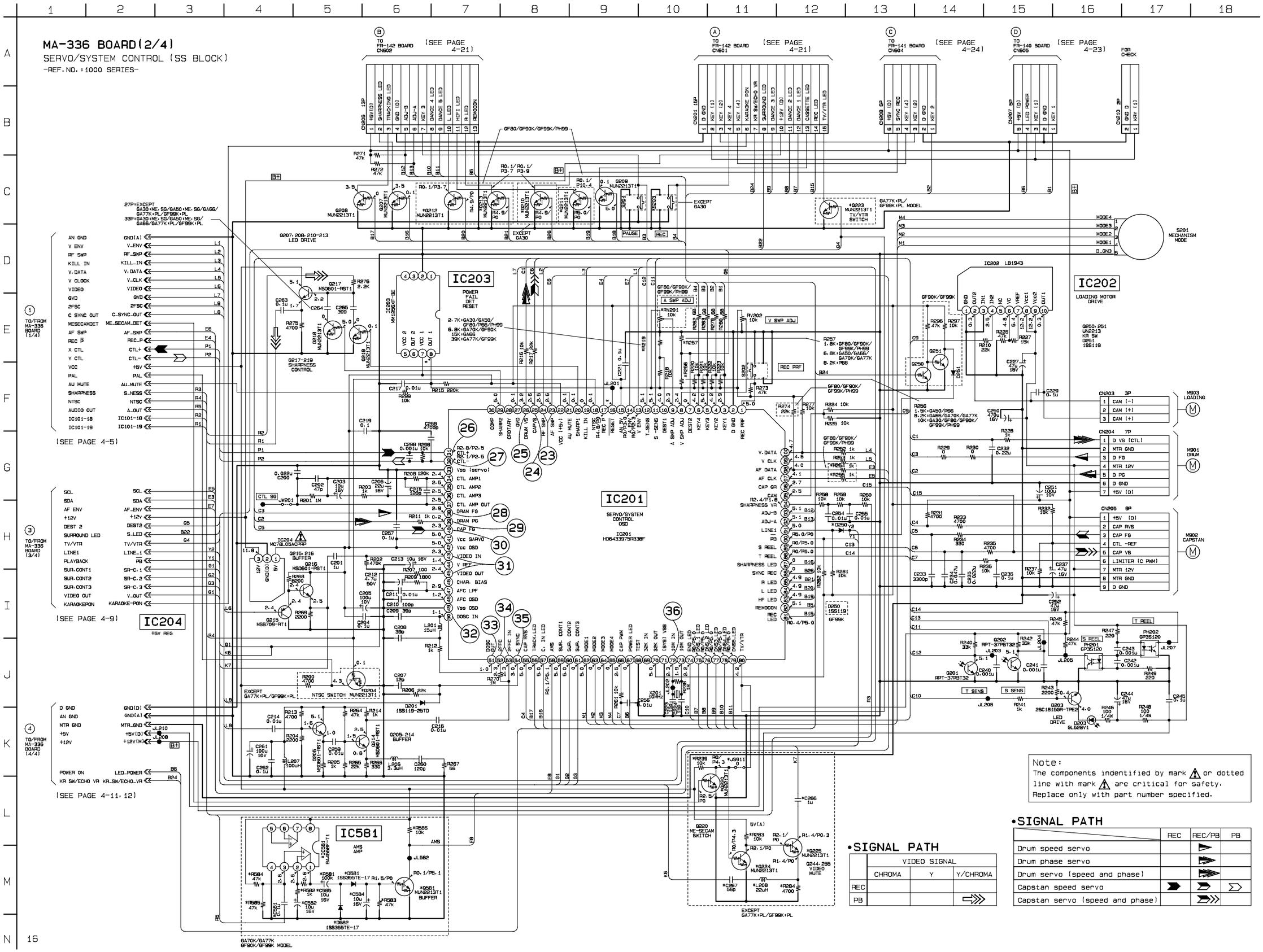
For schematic diagram

- Refer to page 4-13 for printed wiring board.
- Refer to page 4-2 for waveforms.



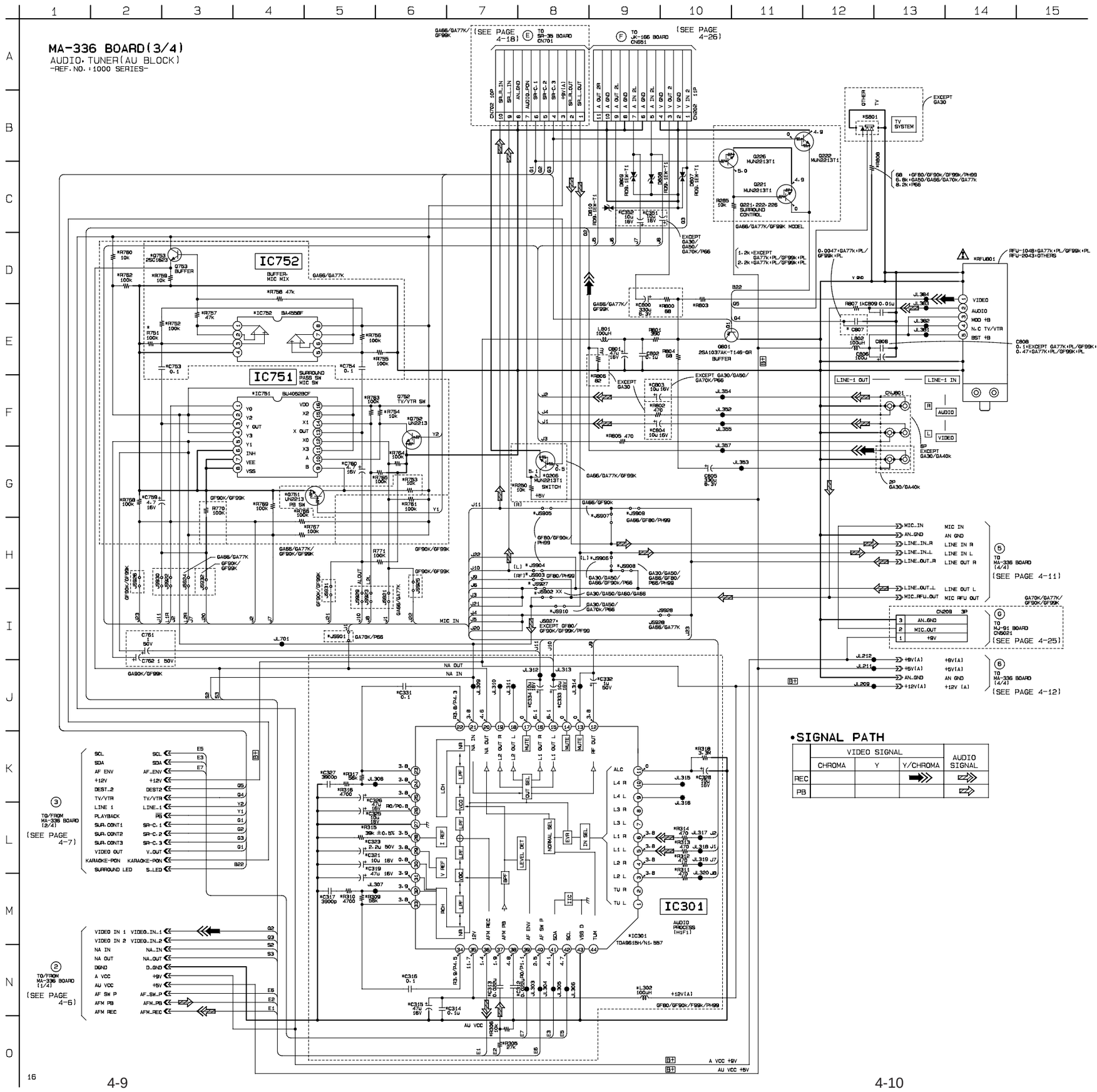
For schematic diagram

- Refer to page 4-13 for printed wiring board.
- Refer to page 4-15 for waveforms.



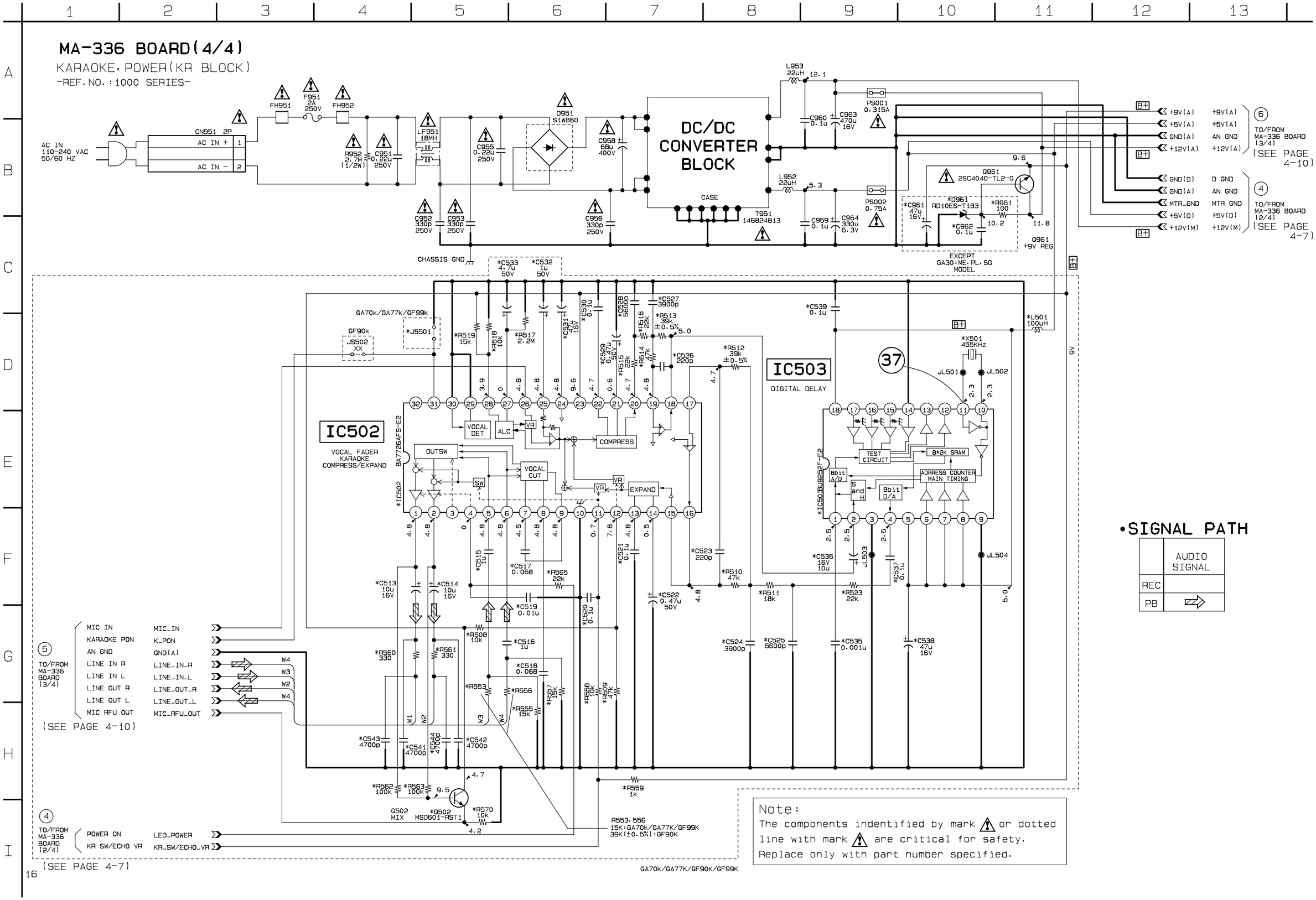
For schematic diagram

• Refer to page 4-13 for printed wiring board.



For schematic diagram

• Refer to page 4-15 for waveforms.



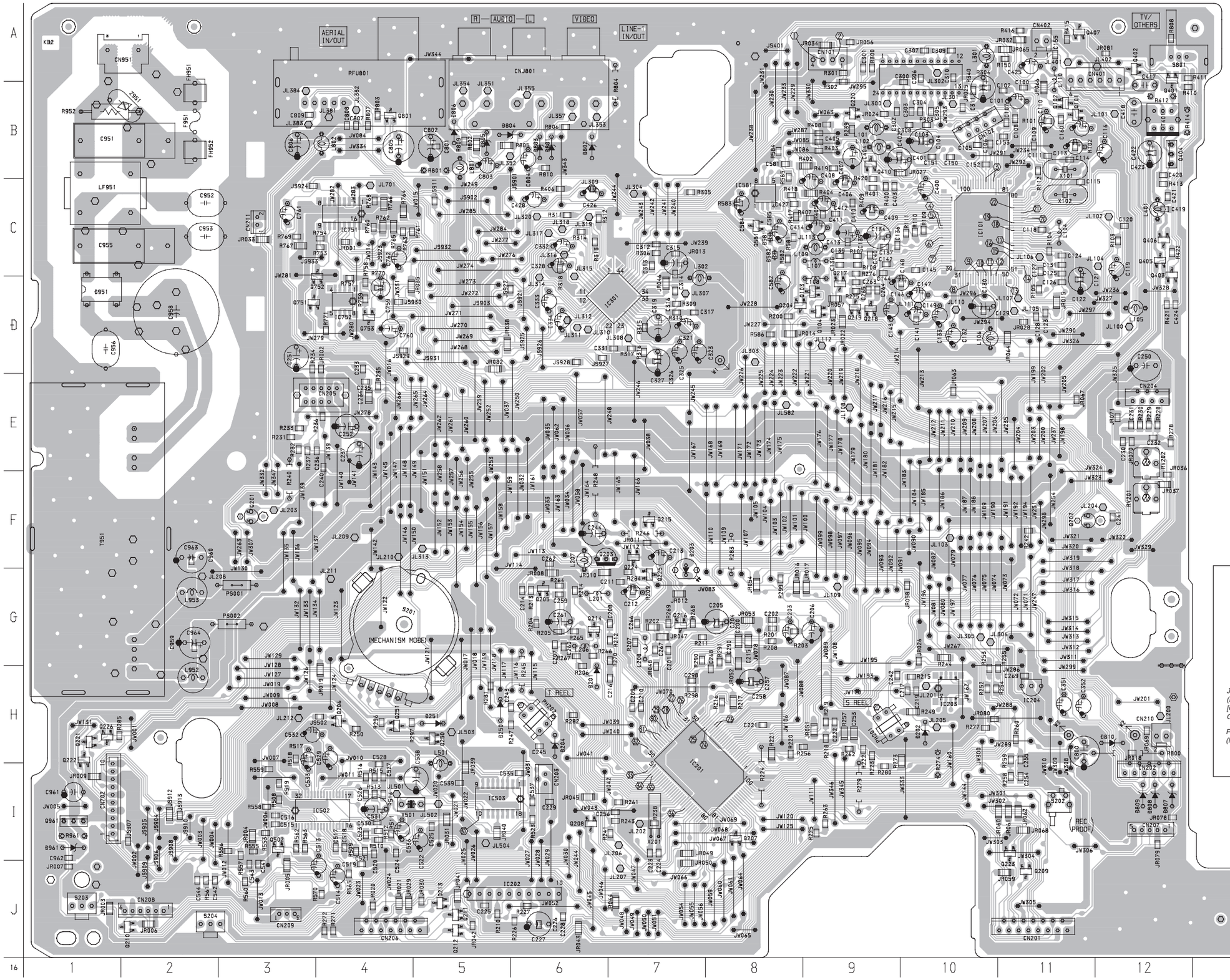
• SIGNAL PATH

	AUDIO SIGNAL
REC	
PB	⇨

MA-336 (VIDEO, AUDIO, SERVO/SYSTEM CONTROL, TUNER, KARAOKE, POWER SUPPLY) PRINTED WIRING BOARD

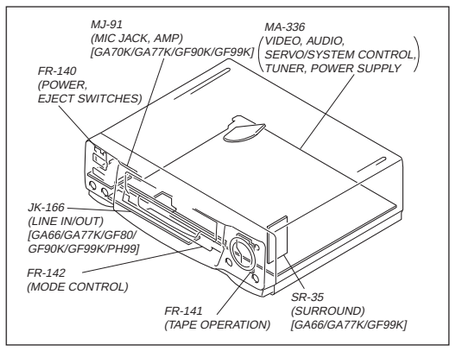
— Ref. No. MA-336 Board; 1,000 Series —

MA-336 BOARD (CONDUCTOR SIDE)



MA-336 BOARD

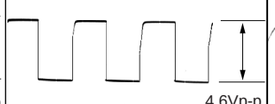
CN101	A-9	Q101	B-11
CN102	B-10	Q102	B-11
CN201	J-11	Q103	C-9
CN202	H-12	Q104	D-8
CN203	I-6	Q201	F-3
CN204	E-12	Q202	F-11
CN205	E-3	Q203	F-6
CN206	J-4	Q204	D-8
CN207	I-1	Q205	G-6
CN208	J-2	Q206	H-4
CN209	J-3	Q207	I-8
CN210	H-12	Q208	I-6
CN401	A-11	Q209	I-11
CN402	A-11	Q210	J-1
CN702	I-1	Q211	J-5
CN951	A-1	Q212	J-5
		Q213	J-5
CNJ801	A-5	Q214	G-6
		Q215	F-7
D201	G-6	Q216	G-7
D203	F-7	Q217	C-9
D250	H-5	Q218	D-9
D251	H-5	Q219	D-9
D581	C-8	Q220	B-9
D582	C-8	Q221	H-1
D807	I-12	Q222	H-1
D808	I-12	Q223	I-11
D809	I-12	Q224	F-7
D810	H-12	Q225	F-7
D951	C-1	Q226	H-1
D961	I-1	Q250	H-5
		Q251	H-4
IC101	C-10	Q401	A-12
IC201	H-7	Q402	A-12
IC202	J-5	Q403	C-12
IC203	H-10	Q404	B-12
IC204	H-11	Q405	C-12
IC301	D-6	Q406	C-12
IC302	A-10	Q407	A-11
IC502	I-3	Q410	B-9
IC503	I-5	Q502	I-3
IC581	B-8	Q581	C-8
IC751	C-4	Q751	D-3
IC752	D-4	Q752	C-3
		Q753	D-4
PH201	H-9	Q801	B-4
PH202	H-6	Q961	I-1



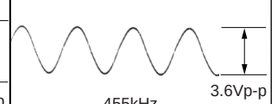
MA-336 BOARD (SERVO/SYSTEM CONTROL, KARAOKE BLOCK)

23 IC201 ㉓㉔ REC/PB

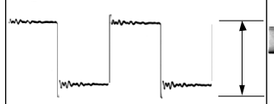
30 IC201 ㊵ REC/PB



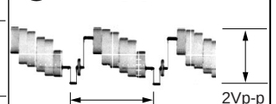
37 IC503 ⑪ REC/PB



24 IC201 ㉕ REC/PB

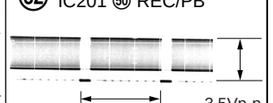


31 IC201 ㊸㊺ REC/PB

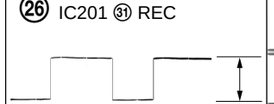


25 IC201 ㉖ REC/PB

32 IC201 ㊿ REC/PB



26 IC201 ㉛ REC

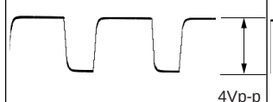


33 IC201 ㊶ REC/PB

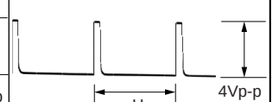
27 IC201 ㉜ REC

34 IC201 ㊸ REC/PB

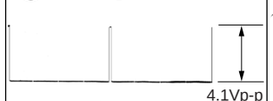
28 IC201 ㊳ REC/PB



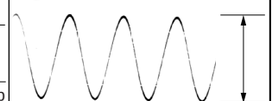
35 IC201 ㊹ REC/PB



29 IC201 ㊴ REC/PB



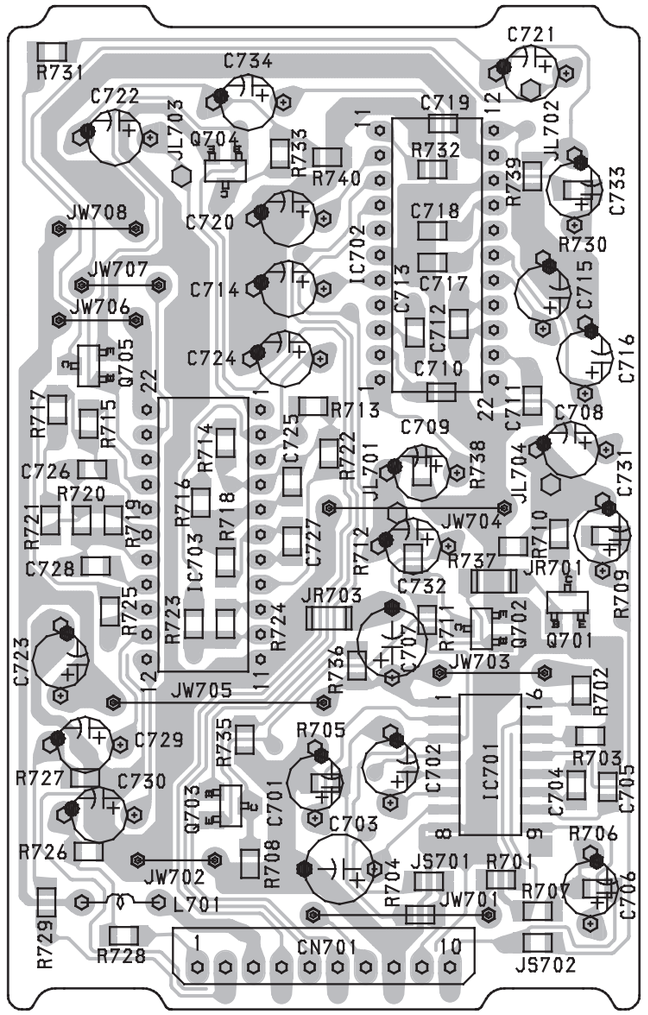
36 IC201 ㉜ REC/PB

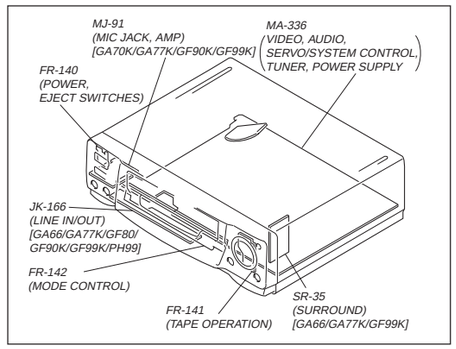


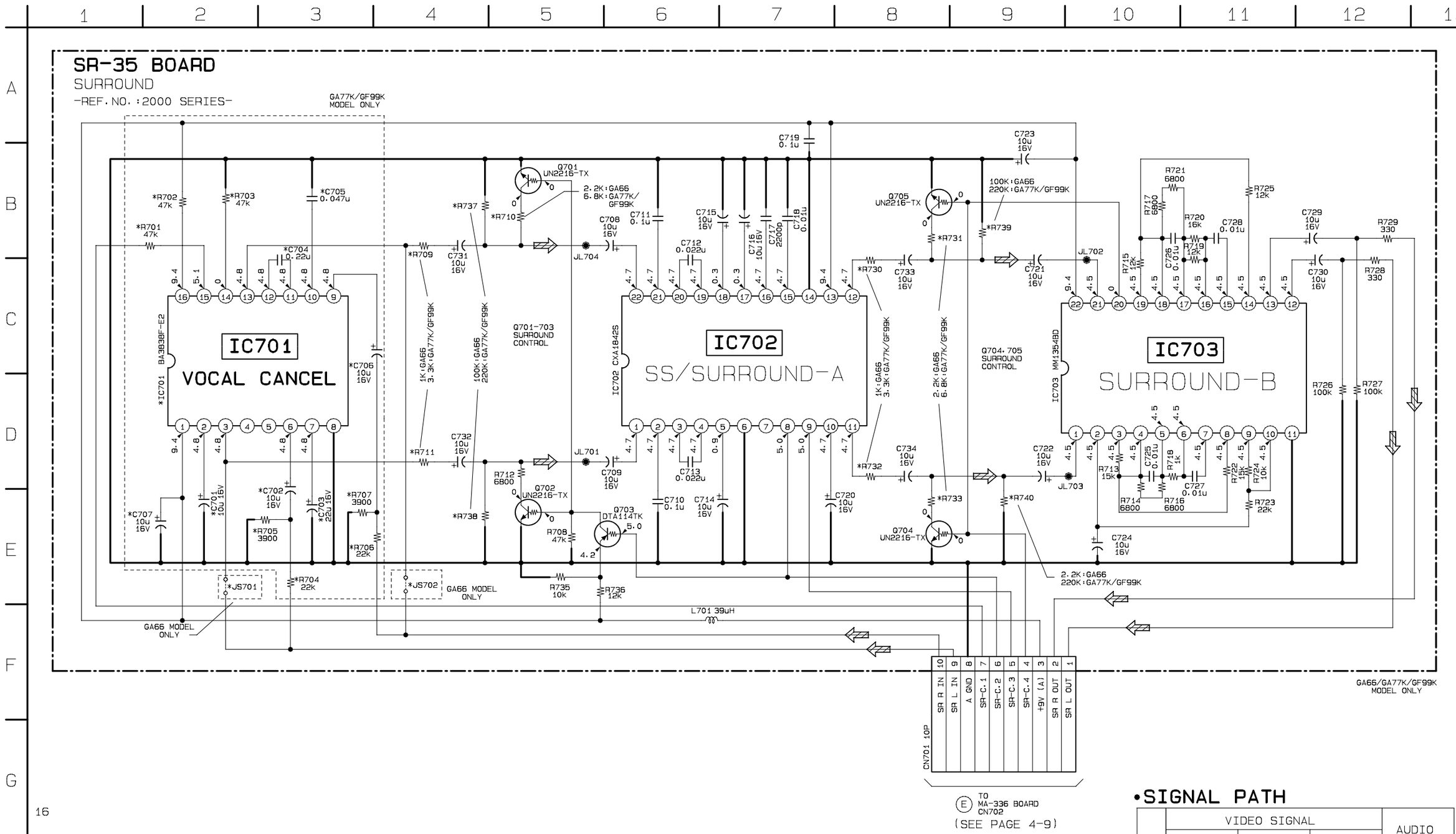
SR-35 (SURROUND) PRINTED WIRING BOARD

— Ref. No. SR-35 Board; 2,000 Series —

SR-35 BOARD
(CONDUCTOR SIDE)





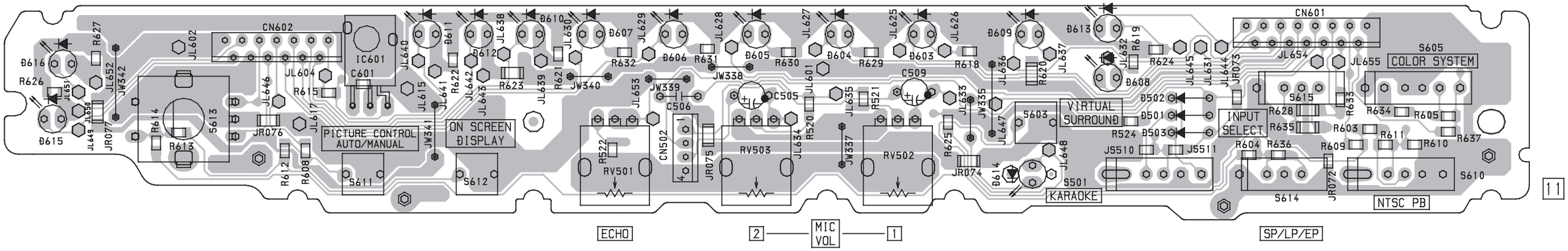


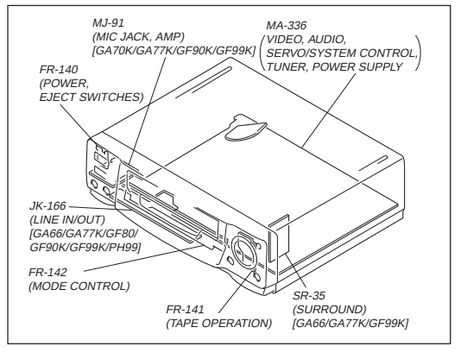
•SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB				⇨

FR-142 (MODE CONTROL) PRINTED WIRING BOARD
— Ref. No. FR-142 Board; 1,000 Series —

FR-142 BOARD (CONDUCTOR SIDE)





FR-142 BOARD
MODE CONTROL
-REF.NO.:1000 SERIES-

EXCEPT GA30 MODEL
GF80/GF90K/GF99K/PH99 MODEL
GA77K:PL/GF99K:PL MODEL
GA66/GA77K/GF99K MODEL

IC601
REMOTE CONTROL RECEIVER
IC601 GP1U26X

CN602 13P
+5V LED 1
SHARPNESS LED 2
TRACKING LED 3
GND 4
ADJ-B 5
ADJ-A 6
KEY 3 7
DANCE 4 LED 8
DANCE 5 LED 9
L LED 10
HIFI LED 11
R LED 12
REMOCON 13

TO MA-336 BOARD CN206 (SEE PAGE 4-7)

CN601 15P
TV/VTR LED 1
REC LED 2
CASSETE LED 3
DANCE 1 LED 4
DANCE 2 LED 5
+12V (D) 6
DANCE 3 LED 7
SURROUND LED 8
KR SW/ECHO VR 9
KARAOKE PON 10
KEY (4) 11
KEY 4 12
KEY (2) 13
KEY (1) 14
GND (D) 15

TO MA-336 BOARD CN201 (SEE PAGE 4-8)

CN502 4P
MIC 1 1
MIC MIX 2
MIC 2 3
GND (A) 4

TO MJ-91 BOARD CN501 (SEE PAGE 4-25)

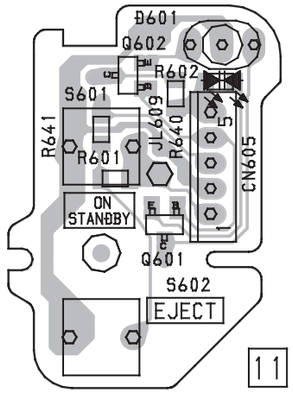
COLOR SYSTEM
AUTO/MANUAL
ON SCREEN DISPLAY
PICTURE CONTROL
SP/LP/EP
INPUT SELECT
VIRTUAL SURROUND
NTSC PB
ECHO
MIC VOL 1
MIC VOL 2
KARAOKE
FUN SEL

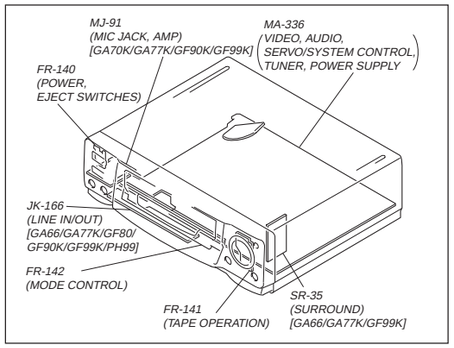
EXCEPT GA77K:PL/GF99K:PL MODEL
GA50:ME:SG/GA66/GA77K:PL/GF99K:PL
GA66/GA77K/GF99K
EXCEPT GF77K:PL/GF99K:PL
GA50:PS:TK/GA66/GA70K/GA77K:PS:TK/GF80/GF90K/GF99K:ME:PS:TK/PH99
GA30/GA50:ME:SG/P66
GA70K/GA77K/GF90K/GF99K MODEL
GA70K MODEL

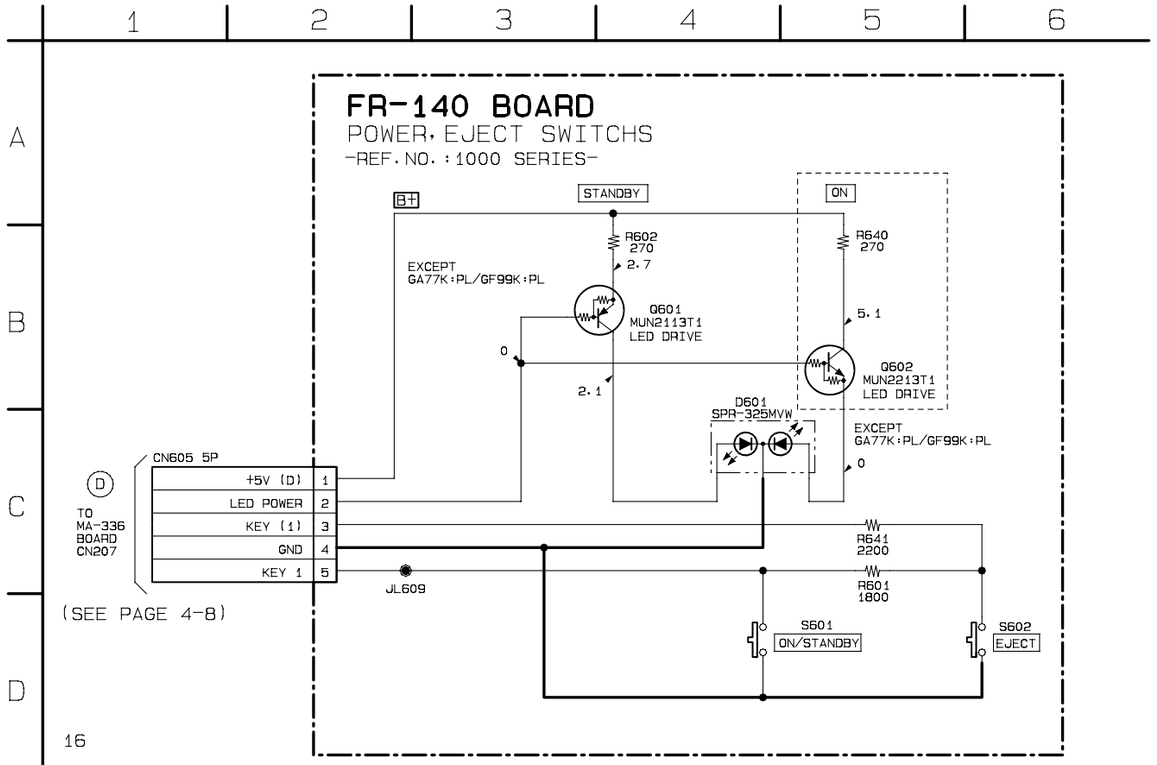
FR-140 (POWER, EJECT SWITCHES) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. FR-140 Board; 1,000 Series —

FR-140 BOARD
(CONDUCTOR SIDE)



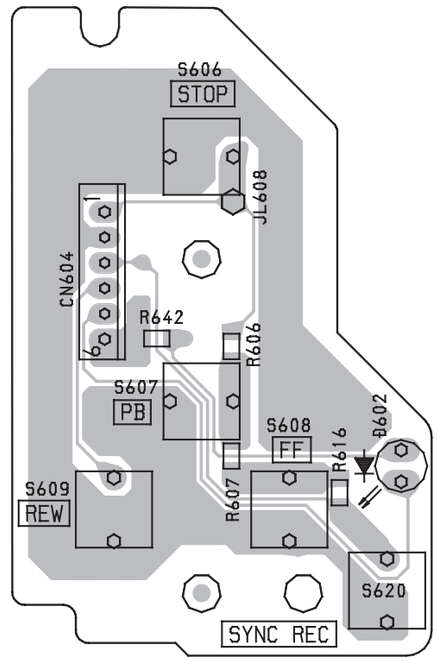


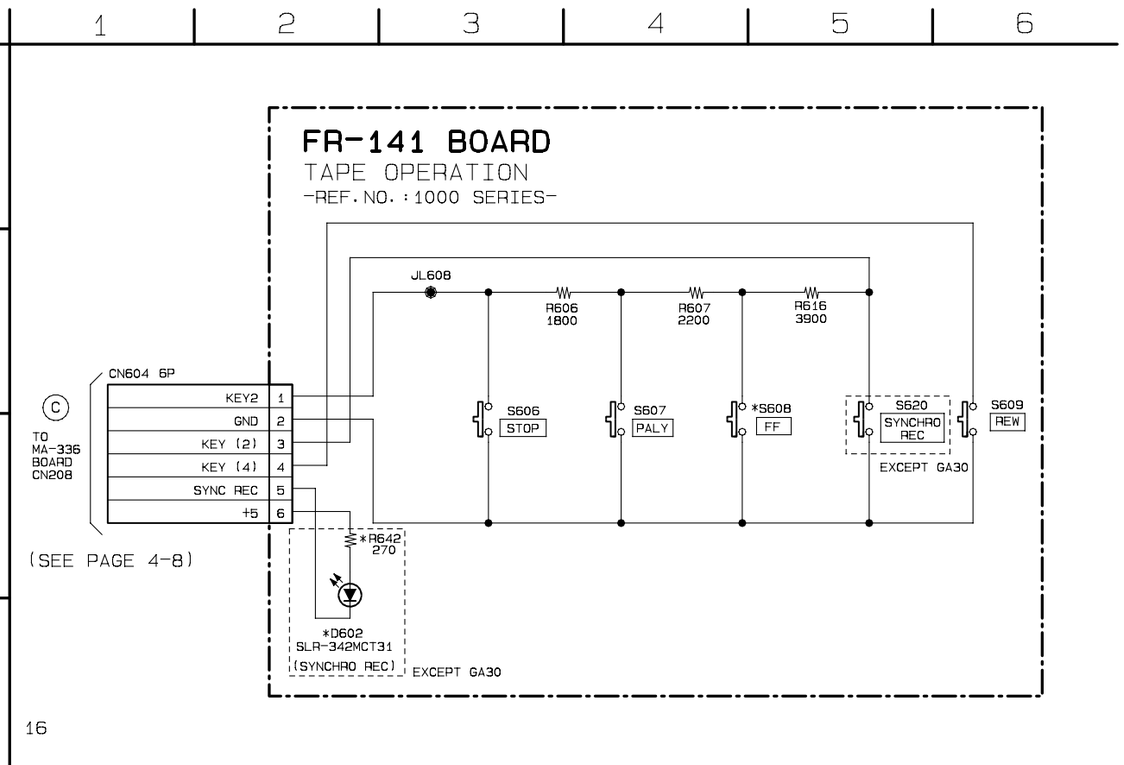


FR-141 (TAPE OPERATION) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. FR-141 Board; 1,000 Series —

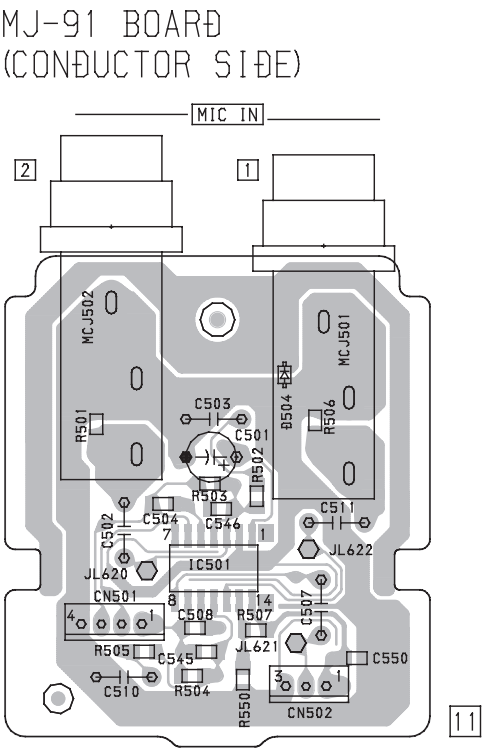
ER-141 BOARD
(CONDUCTOR SIDE)

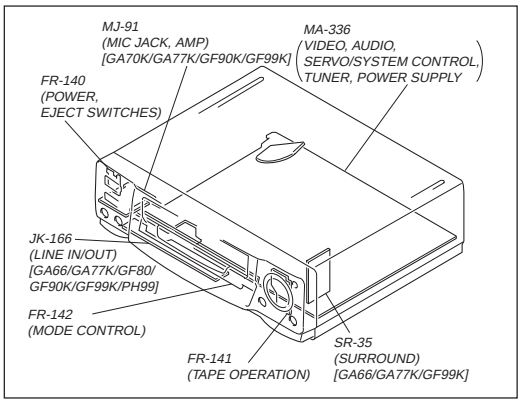


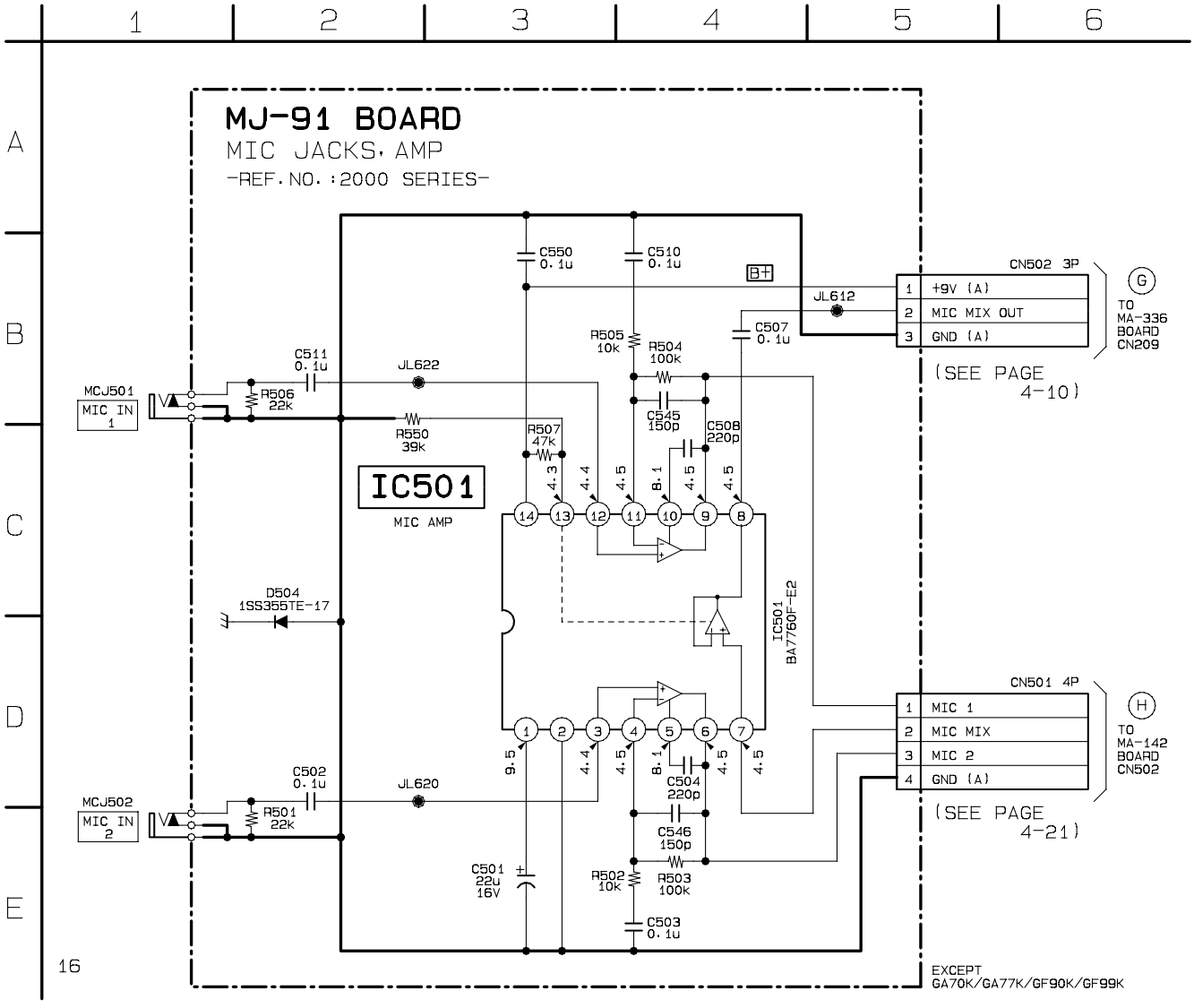


MJ-91 (MIC JACK, AMP) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. MJ-91 Board; 2,000 Series —



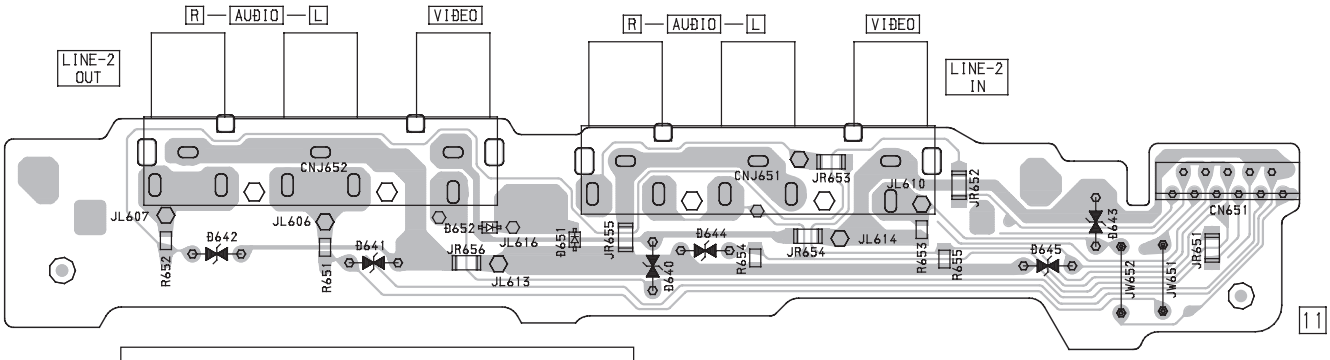


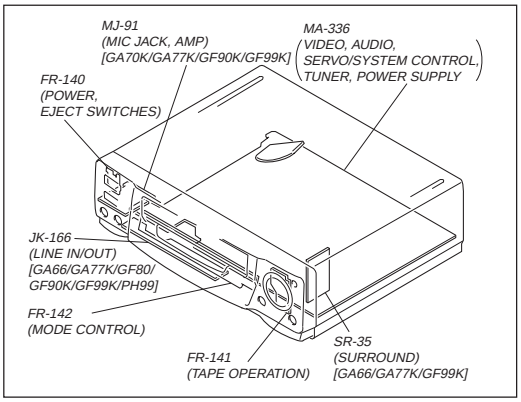


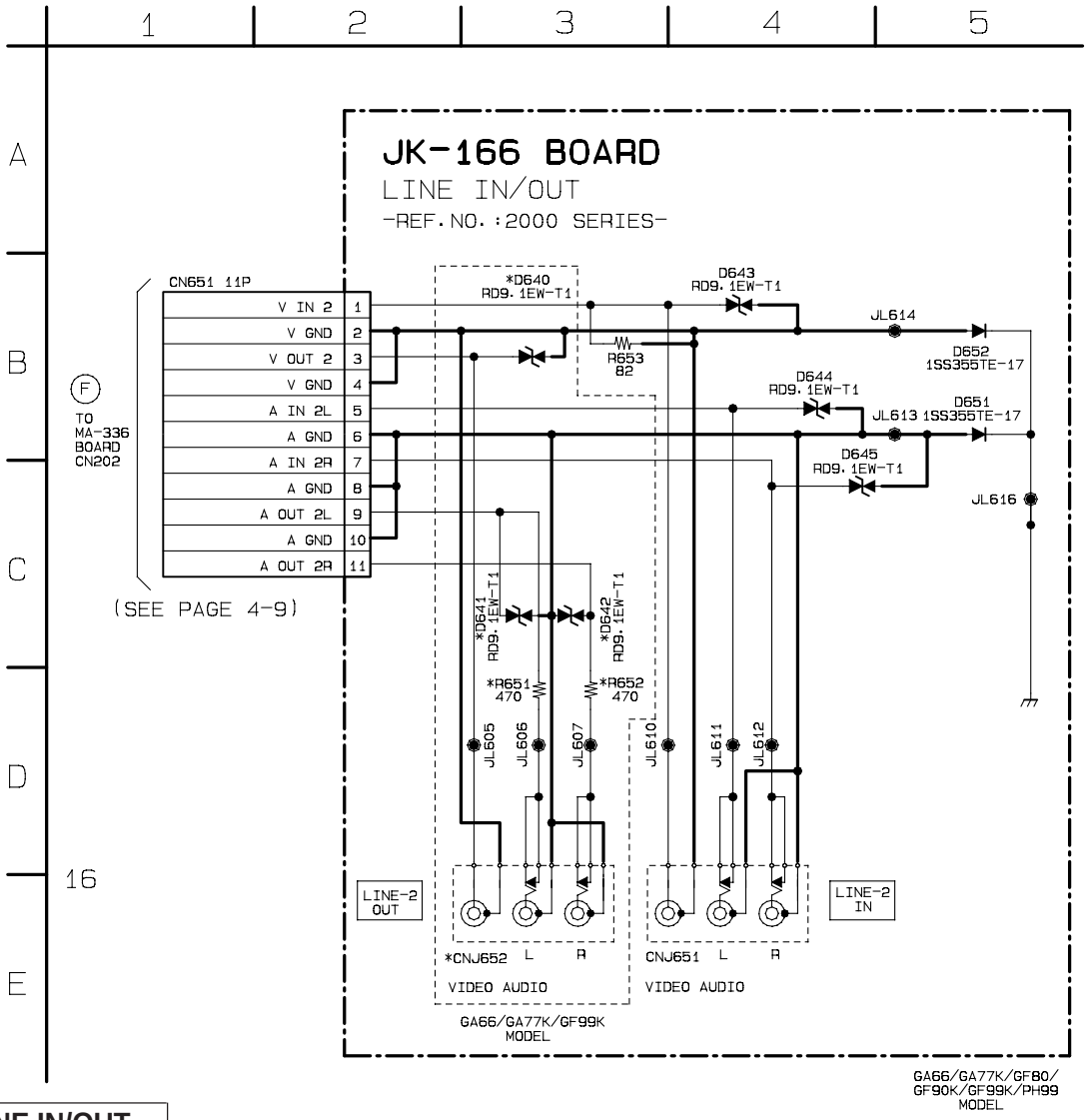
JK-166 (LINE IN/OUT) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

— Ref. No. JK-166 Board; 2,000 Series —

JK-166 BOARD (CONDUCTOR SIDE)







5-1. SYSTEM CONTROL — VIDEO BLOCK INTERFACE (MA-336 BOARD IC201)

Signal	Pin No.	I/O	STOP FF/REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
RF SWP	㉔	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1
QVD	㉗	O	L	L	L	*2	*3	*3	*2	*3	*3	L	L
C SYNC	㊹	I	*4	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
NT JUDGE	⑱	O	L	L	L	L	L	L	L	L	L	L	L

*1 Synchronized with drum rotation. 25 Hz (PAL), 30 Hz (NTSC) 50% duty cycle.
*2 Normally “L“. “H“ when CTL signal is not generated.
*3 V period “H“ pulse.
*4 Selected by REC mode. “H“ in LP mode.“
*5 Composite sync signal (positive).

5-2. SYSTEM CONTROL — SERVO PERIPHERAL CIRCUIT INTERFACE (MA-336 BOARD IC201)

Signal	Pin No.	I/O	STOP	FF	REW	TAPE THREADING	TAPE UNTHREADING	PB	PB PAUSE	SLOW	CUE	x 2	REVIEW	REC	REC PAUSE
CTL (+)	㉛	O	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	Hi-Z	*1	Hi-Z
CTL (–)	㉜	I	H	*6	*6			*1	H/L	*2	*6	*6	*6	*1	H
DRM PG	㊴	I	*4	*1	*1	*5	*5	*1	*1	*1	*1	*1	*1	*1	*1
DRM FG	㊳	I	*4	*7	*7	*5	*5	*7	*7	*7	*7	*7	*7	*7	*7
CAP FG	㊵	I	H/L	*6	*6	*5	*5	*6	H/L	*2	*6	*6	*6	*6	H/L
CAP VS	㉕	O	*8	*8	*8	*8	*8	*9	*8	*8	*9	*8	*9	*9	*8
DRM VS	㉖	O	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10	*10

*1. 25 Hz (PAL), 30 Hz (NTSC) pulse.
*2. Pulse at tape running.
*3. Reverse logic pulse of STEP PLS.
*4. “L” when drum rotation stops.
*5. Unstable period pulse.
*6. Pulse in period in proportional to tape speed.
*7. 300 Hz (PAL), 360 Hz (NTSC) pulse.
*8. Pulse at tape running.
*9. Approx. 2 msec period “H” or “L” pulse.
*10. Approx. 1.5 msec period “H” or “L” pulse.
*11. “L” when FWD SLOW, “H” when RVS SLOW.

5-3. SYSTEM CONTROL — MECHANISM INTERFACE (MA-336 BOARD IC201)

Signal	Pin No.	I/O	EJECTED	CASSETTE LOADING	CASSETTE UNLOADING	TAPE THREADING	TAPE UNTHREADING	STOP	FF	REW	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
CAM2	㉟	HI-Z	L	H	L	H	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
MODE 1 (*8)	㉜	I	H	L	L	*1	*1	H	H	H	H	H	H	H	H	L	H	H
MODE 2 (*8)	㉝	I	H	L	L	*1	*1	H	H	H	L	L	L	L	L	L	L	L
MODE 3 (*8)	㉞	I	L	L	L	*1	*1	H	L	L	L	L	L	L	L	H	L	L
MODE 4 (*8)	㉟	I	L	H	H	*1	*1	L	H	H	H	L	L	L	L	L	L	L
REC PRF	①	I	H	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
T REEL FG	㊽	I	H/L	H/L	H/L	H/L	H/L	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
S REEL FG	㊾	I	H/L	H/L	H/L	*3	*3	H/L	*3	*3	*3	H/L	*3	*3	*3	*3	*3	H/L
END LED	㉔	O (O.D)	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP RVS	㉕	O	H			L	H	H/L	L	H	L	L	L/*5	L	L	H	L	L
T SENS	⑫	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
S SENS	⑪	I	*4	*4	*4	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6

*1. Uncertainly.
*2. “L” when erasing protection tab is bent. “H” when not bent.
*3. Pause of period in proportion to reel rotating speed.
*4. Approx. 2 msec period “H” pulse.
*5. Pulse at tape running.
*6. Normally “L”. 2 msec period “H” pulse when tape top or tape end is detected.
*7. When transition to UNLOADING direction : “L”.
When transition to LOADING direction : “H”.
When CAM MOTOR is stopped : Hi-Z.
*8. When RVS slow : Mode 1=”L”
When RVS slow : Mode 2=”L”
When RVS slow : Mode 3=”H”
When RVS slow : Mode 4=”L”

5-4. SYSTEM CONTROL — AUDIO BLOCK INTERFACE (MA-336 BOARD IC201)

Signal	Pin No.	I/O	STOP/FF/ REW	TAPE LOADING	TAPE UNLOADING	PB	PB PAUSE	SLOW	x 2	CUE	REVIEW	REC	REC PAUSE
AF ENV	⑭	I	AF RF envelope signal input terminal for automatic tracking.										
A MUTE	㉑	O (O.D)	L	L	L	*1	H	H	H	H	H	L	L
AF REC $\overline{P}$	⑰	O	L	L	L	L	L	L	L	L	L	H	L
AF SWP	㉓	O	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1

*1. 30 Hz 50 % duty pulse approx. 5 msec delayed from RF SW P.

5-6. SERVO/SYSTEM CONTROL MICROPROCESSOR PIN FUNCTIONS (MA-336 BOARD IC201)

Pin No.	Pin Name	I/O	Function
1	REC PRF	I	Erasing protection tab. cassette in detection.
2	AVSS		Analog circuit ground
3	KEY1	I (A/D)	Analog voltage (KEY) input 1.
4	KEY2	I (A/D)	Analog voltage (KEY) input 2.
5	KEY3	I (A/D)	Analog voltage (KEY) input 3.
6	KEY4	I (A/D)	Analog voltage (KEY) input 4.
7	DEST2	I (A/D)	Destination discrimination input 2
8	V SWP ADJ	I (A/D)	Video switching position adjustment
9	A SWP ADJ	I (A/D)	Audio switching position adjustment
10	DEST	I (A/D)	Destination discrimination input 1
11	S SENS	I (A/D)	Supply side end sensor input
12	T SENS	I (A/D)	Take-up side end sensor input
13	VIDEO RF	I (A/D)	Video RF envelope input
14	AUDIO RF	I (A/D)	HiFi audio envelope input
15	AVCC		Analog circuit power supply
16	RESET	I	Reset signal input
17	REC P	O	HiFi pre-amp, linear audio REC bias. REC PAUSE: L.
18	NTSC	O	Video IC NTSC: H, PAL: L
19	KILL IN	I	Video IC
20	SHARPCONT1	O	SHARPNESS control H: Active
21	AU MUTE	O	Video IC Mute on: H, Mute off: L
22	VCC		Power supply
23	AF SWP	O	AF switching pulse output
24	RF SWP	O	RF switching pulse output
25	CAP VS	O	Capstan error output
26	DRUM VS	O	Drum error output
27	QVD	O	Quasi VD pulse output
28	NC		Not connected
29	SHARPCONT2	O	SHARPNESS control H: Active
30	NC		Not connected
31	CTL (+)	I/O	CTL signal I/O
32	CTL (–)	I/O	CTL signal I/O
33	VSS (SERVO)		Servo circuit ground
34	CTLI-1		CTL amp control output
35	CTLI-2		CTL amp control input
36	CTLI-3		CTL amp control output
37	CTLAMP		CTL amp output
38	DRUM FG	I	Drum FG input
39	DRUM PG	I	Drum PG input
40	CAP FG	I	Capstan FG input
41	VCC (SERVO)		Servo circuit power supply
42	VCC (OSD)		OSD circuit power supply
43	CVIN	I	Video signal input for character generator
44	VREF		
45	CVOUT	O	Video signal output from character generator
46	CHAR. BIAS		External character brightness level input
47	AFC LPF		AFC LPF pin input
48	AFC OSC		AFC oscillator pin input
49	VSS(OSD)		OSD circuit ground
50	DOSC IN	I	DOSC IN

Pin No.	Pin Name	I/O	Function
51	DOSC OUT	O	DOSC OUT
52	2FSC	O	2FSC
53	2FSC IN	I	2FSC IN
54	CSYNC	I	Composite sync. signal input
55	CAP RVS	O	Capstan reverse control signal in FWD: H, REV: L
56	TRACK. LED	O	Auto tracking LED On: H, Off: L
57	C. IN LED	O	Cassette in LED On: H, Off: L
58	AMS	I	Auto music search
59	SUR. CONT1	O	Surround control signal output 1
60	SUR. CONT2	O	Surround control signal output 2
61	SUR. CONT3	O	Surround control signal output 3
62	MODE1	I	Mechanism CAM encoder input 1
63	MODE2	I	Mechanism CAM encoder input 2
64	MODE3	I	Mechanism CAM encoder input 3
65	MODE4	I	Mechanism CAM encoder input 4
66	CAP TRQ PWM	O (PWM)	Capstan torque PWM output
67	POWER LED	O	Power LED control On: H, Off:L
68	TEST		Not used. Connected to ground.
69	32 kHz (IN)	I	32 kHz clock terminal
70	32 kHz (OUT)	O	32 kHz clock terminal
71	VSS		Ground
72	10 MHz (IN)	I	10MHz clock terminal
73	10 MHz (OUT)	O	10MHz clock terminal
74	END LED	O	LED pulse drive
75	DNS 1 LED	O	LED On: L, Off: H
76	DNS 2 LED	O	LED On: L, Off: H
77	DNS 3 LED	O	LED On: L, Off: H
78	DNS 4 LED	O	LED On: L, Off: H
79	DNS 5 LED	O	LED On: L, Off: H
80	MESECAM DET, TV/VTR	I/O	SECAM IC RF converter/TV/VTR select
81	REC LED	O	REC LED On: H, Off: L
82	SIRCS	I	SIRCS signal input
83	HF LED	O	HiFi LED On: H, Off: L
84	L LED	O	L ch LED On: H, Off: L
85	R LED	O	R ch LED On: H, Off: L
86	SUR LED-SYNC REC	O	Surround/SYNC REC LED On: H, Off: L
87	SHARPNESS LED	O	SHARPNESS LED On: H, Off: L
88	T REEL	I	Take-up reel FG input
89	S REEL	I	Supply reel FG input
90	PB	O	Play mode: L
91	LINE1	O	LINE 1 select
92	ADJ-B	I	PICTURE CONTROL signal input
93	ADJ-A	I	PICTURE CONTROL signal input
94	SHARPNESS VR	O	Video IC Sharpness Voltage
95	CAM	O (3 VALUES)	CAM motor drive H: Forward, M: Brake, L: Reverse
96	CAP QR	O	Capstan motor
97	AF CLK	O	I2C-bus clock(HiFi)
98	AF DATA	O	I2C-bus data(HiFi)
99	V CLK	O	I2C-bus clock(Video)
100	V DATA	O	I2C-bus data(Video)

SECTION 6
ADJUSTMENTS

6-1 MECHANICAL ADJUSTMENTS

For the mechanical adjustments, please refer to the "VHS MECHANICAL ADJUSTMENT MANUAL Ⅵ (S MECHANISM)" (9-921-647-11).

6-2. ELECTRICAL ADJUSTMENTS

See the adjusting part location diagram from on page 6-6 for the adjustment.

2-1. PREPARATION BEFORE ADJUSTMENT

2-1-1. Equipment Required

The measuring instruments used for this alignment include:

1) Monitor TV
2) Oscilloscope, dual-trace, bandwidth of 30 MHz or more, with delay mode (A probe 10:1 should be used unless otherwise specified.)
3) Frequency counter
4) NTSC Pattern generator
5) PAL Pattern generator
6) Digital voltmeter
7) Audio generator
8) Audio level meter
9) Audio attenuator
10) Alignment tapes
    KRV-51P (PAL) Part No. : 8-192-605-36
    KRV-51N2 (NTSC) Part No. : 8-192-605-32

2-1-2. Equipment Connection

Unless otherwise specified, connect and adjust the measuring instruments as shown in the following diagram.

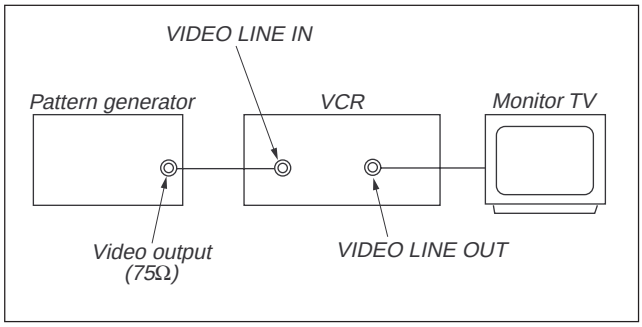


Fig. 6-2-1

2-1-3. Set-up of Adjustment

In this adjustment, PAL or NTSC pattern generator is connected with LINE input terminal. When check to tuner, connected AERIAL terminal. Check that the synchronizing signal of the Y signal has an amplitude of approximately 0.7 V and that the burst signal has an amplitude of approximately 0.3 V and its waveform is flat. And check that the level ratio of burst signal to "red" signal is 0.30 : 0.66. The video signal (color bar) used for electrical aligning this unit is shown in Fig. 6-2-2.

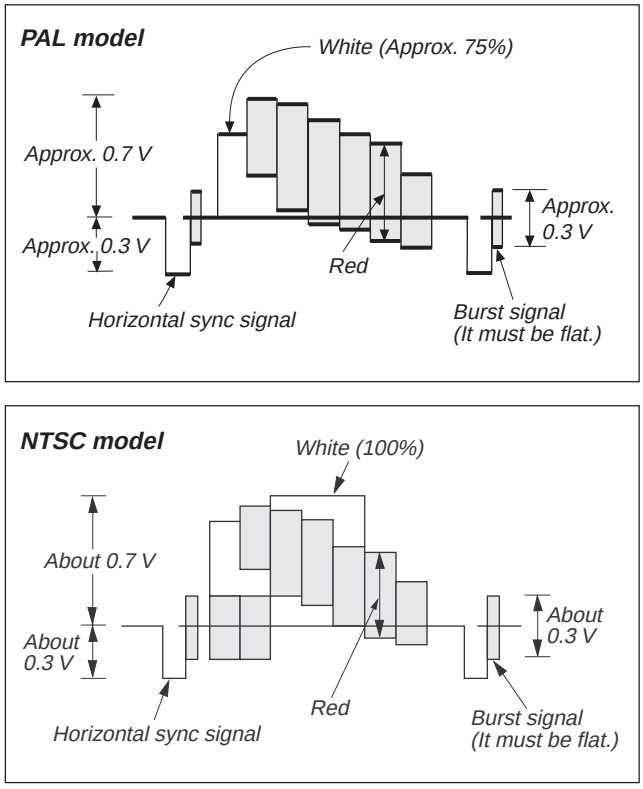


Fig. 6-2-2 Color Bar Signals of Pattern Generator

2-1-4. Alignment Tape

• Contents of KRV-51N2/51P

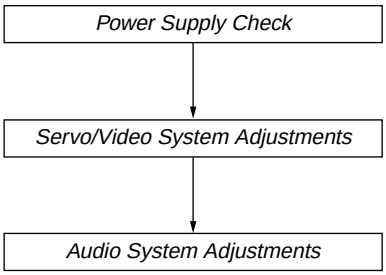
	Mode	Period	Video signal	Audio signal	
				Hi-Fi	Normal
1	SP	7 minutes	Color bar	400Hz (L/R)	400Hz
2		3 minutes	Monoscope		
3	LP	7 minutes	Color bar		
4		3 minutes	Monoscope		

2-1-5. Input/Output Levels and Impedance

Video input: LINE IN
Input signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Video output: LINE OUT
Output signal: 1 Vp-p, 75 ohms, unbalanced, sync negative
Audio input: LINE IN
Input level: –7.5 dBs
(0 dBs= 0.775 Vrms)
Input impedance: more than 47 kilohms
Audio output: LINE OUT
Standard level: –7.5 dBs at load impedance 47 kilohms
Output impedance: less than 10 kilohms

2-1-6. Adjustment Sequence

The adjustments should be performed in the following sequence.



2-2. POWER SUPPLY CHECK

2-2-1. Output Voltage Check (MA-336 Board)

Mode	E-E
Measuring Instrument	Digital voltmeter
+12 V Check	
Measurement point	CN201 pin ⑩
Specified value	11.5 –13.0 V
+5 V Check	
MP	CN206 pin ⑬
SV	5.0 –5.6 V
+9 V Check	
MP	Emitter of Q961
SV	8.5 –10.0 V
MTR12 V Check	
Measurement point	CN204 pin ④
Specified value	11.5 –13.0 V

[Check Method]

1) Each of these supply voltages must meet its specified value.

2-3. SERVO SYSTEM CHECK

2-3-1. RF Switching Position Adjustment (MA-336 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Video LINE OUT (75 Ω terminated) (AF switching position) CH2: CN101 pin ③ (V SWP)
Measuring instrument	Oscilloscope
Adjusting element	RV202
Specified value	6.5 ± 1 H (413 ± 60 μσεχ): NTΣX 6.5 ± 1 H (416 ± 32 μsec): PAL

[Adjustment Method]

1) Playback the alignment tape.
2) Short-circuit between pins ① and ② of CN210.
3) Check that "RF" is indicated on FL display.
4) Check that switching position is 6.5 ± 1 H.
5) If not meet the specified value, turn RV202 and repeat steps 1) to 3).

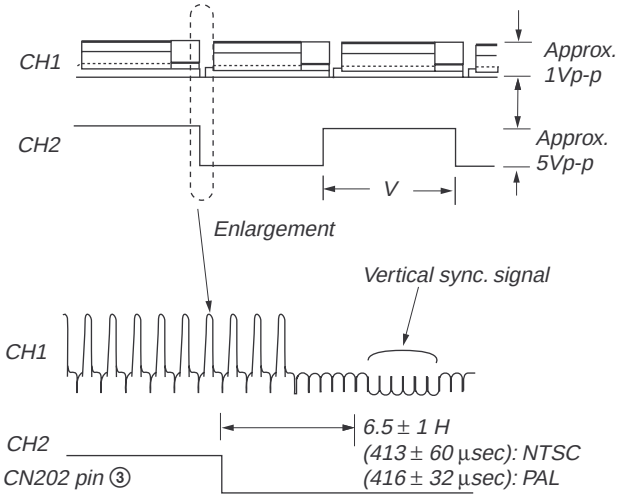


Fig. 6-2-3

2-4. AUDIO SYSTEM ADJUSTMENT

- Adjust both L ch and R ch.

[Connecting Instruments]

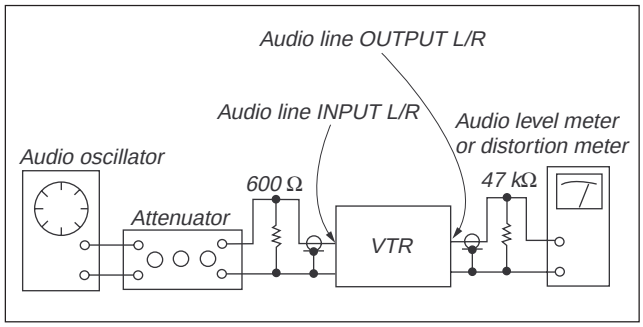


Fig. 6-2-4

2-4-1. Hi-Fi Audio System Adjustment (Hi-Fi model only)

- Perform the adjustment setting the switch on the following positions.
- AUDIO MONITOR ..... STEREO

[Adjustment Method]

1. ACE head adjustment.....Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM)(9-921-647-11).
2. E-E output level check
3. "Recording Bias Adjustment"

1. AF Switching Position Adjustment (MA-336 Board)

[Adjustment Purpose]

To adjust the link of the A-ch and B-ch of the tape playback outputs. To make the unit compatible with other tapes and units. If this specification is not satisfied, the link will appear on the screen and the screen will be disrupted, etc.

Mode	Playback
Signal	Alignment tape: SP color bar portion
Measurement point	CH1: Pin ③ of CN101 CH2: Pin ① of CN101
Measuring instrument	Oscilloscope
Adjusting element	RV201
Specified value	Fig. 6-2-5

[Adjustment Method]

1) Playback the alignment tape.
2) Short-circuit between pins ① and ② of CN210.
3) Adjust RV201 to minimize a chipped portion. At this time, confirm that a noisy sound is not heard.

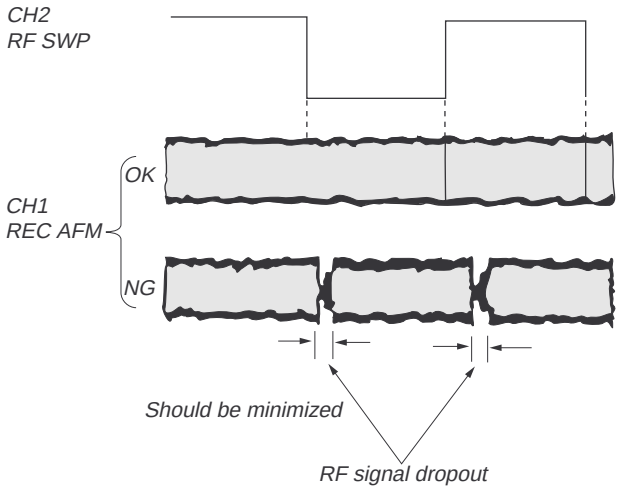


Fig. 6-2-5

2-4-2. Normal Audio System Adjustment

- Make adjustment in the SP mode unless otherwise specified. Use a normal VHS cassette for an adjustment tape.
- Set AUDIO MONITOR to normal.

1. ACE Head Adjustment

Refer to the VHS mechanical adjustment manual Ⅵ (S MECHANISM) (9-921-647-11).

2. E-E Output Level Check

[Adjustment purpose]

Confirm that the output level adjust the reference input is within the specification.

Mode	E-E
Signal	400 Hz, –7.5 dBs
Measurement point	CJ461 L/R
Measuring instrument	Audio level meter
Specified value	–7.5 ± 2 dBs

[Check Method]

1) Input signal of 400 Hz and –7.5 dBs to the CJ461 L/R.
2) Check that the audio output level is –7.5 ± 2 dBs.

3. Recording Bias Check

[Adjustment purpose]

Confirm that the frequency characteristic is within the specification.

Mode	REC and PB (SP mode)
Signal	400 Hz, –27.5 dBs 7 kHz, –27.5 dBs
Measurement point	Audio output terminal
Measuring instrument	Audio level meter
Specified value	0 ± 3 dB

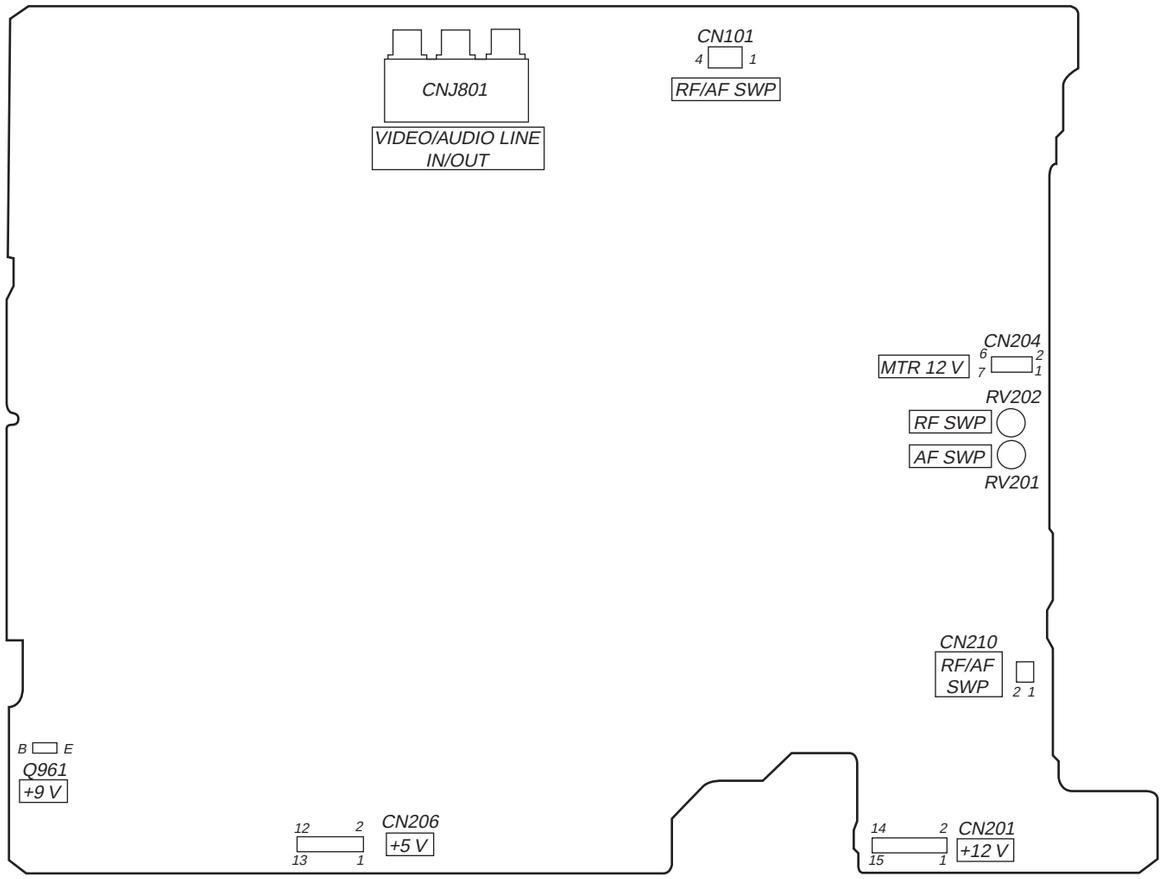
Note: Tape path adjustment must have been completed.

[Confirmation Method]

1) Supply a signal of 400 Hz, –27.5 dBs to both L and R channels of Audio Line Input.
2) Connect the audio level meter to the Audio Line Output.
3) Adjust the attenuator so that the audio level meter will indicate –27.5 dBs.
4) Make recording in the SP mode.
5) Set an audio line input signal to 7 kHz and make recording.
6) Playback a recorded portion, and measure output levels at 400 Hz and 7 kHz.
7) Confirm that the 7 kHz playback output level within a range of the 400 Hz playback output level 0 ± 3 dB.

2-5. ADJUSTING PARTS LOCATION DIAGRAM

MA-336 BOARD
(CONDUCTOR SIDE)



SECTION 7
REPAIR PARTS LIST

7-1. EXPLODED VIEWS

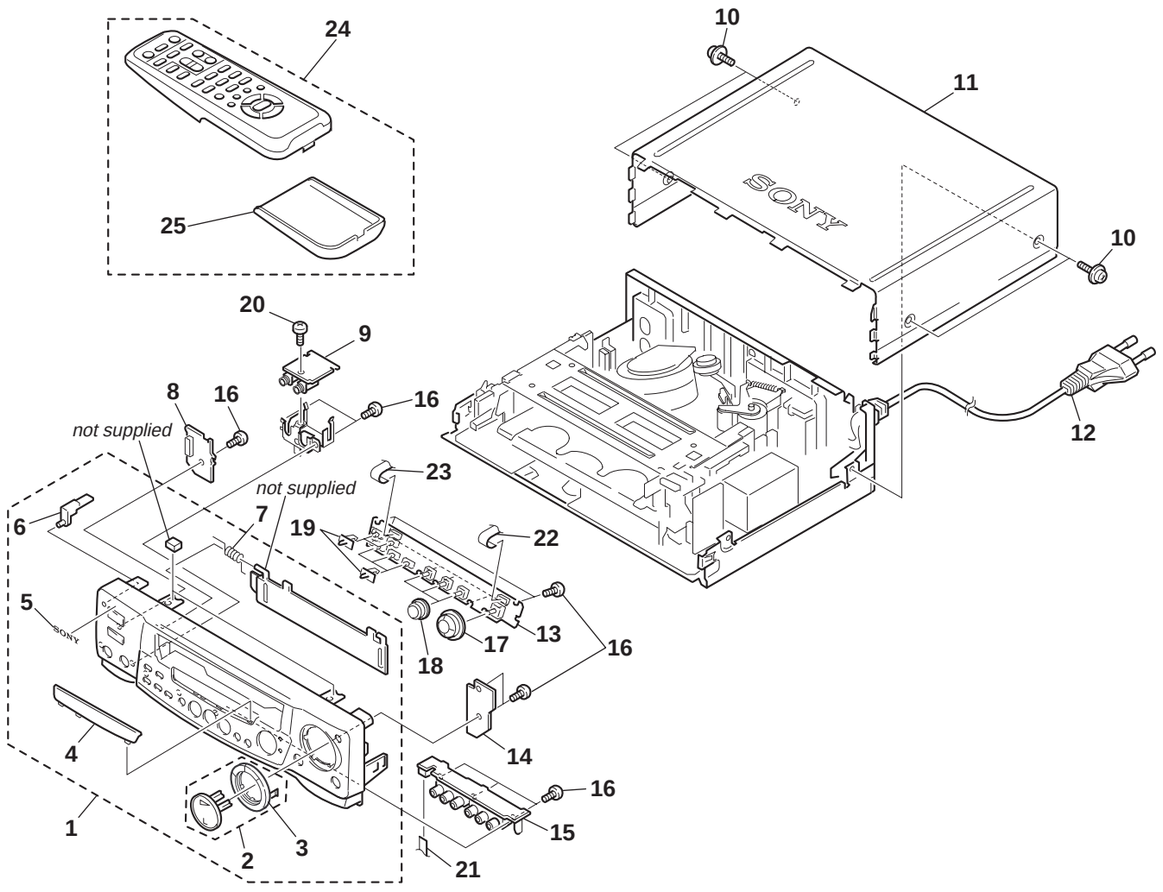
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- Abbreviation
  SG: Gulf Model
  EE: East European Model
  PS: Pan Asia Model
  PL: Philippine Model
  TK: Thai Model

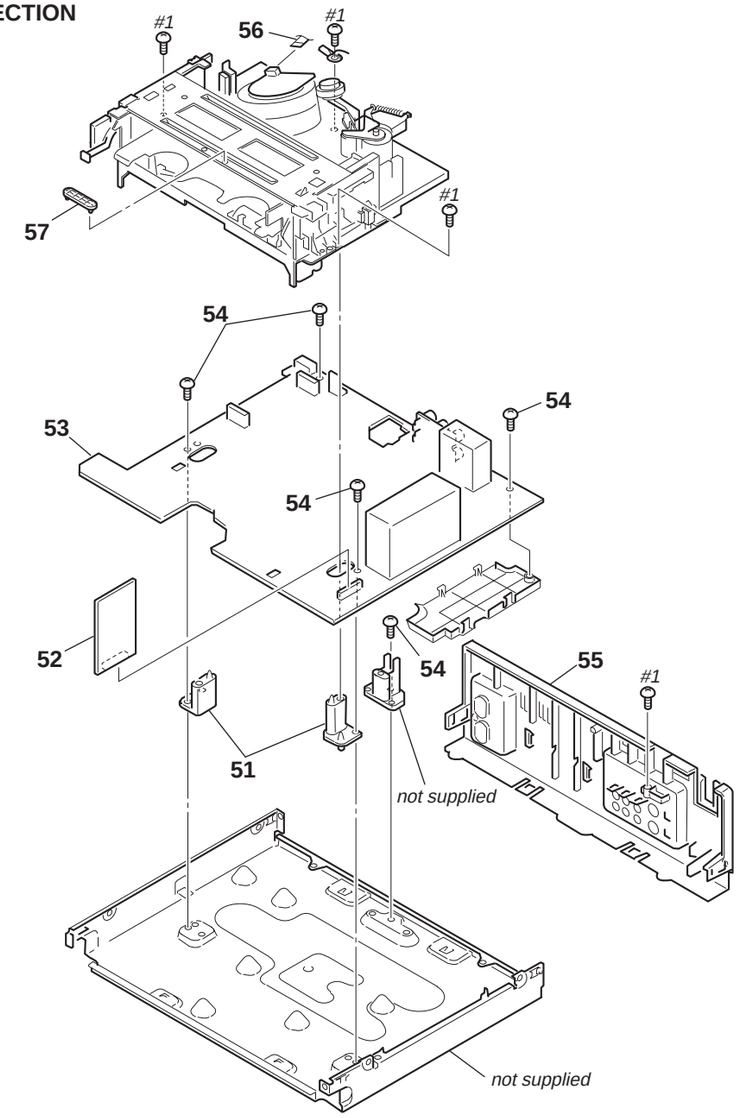
7-1-1. FRONT PANEL AND UPPER CASE SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3949-068-1	FRONT PANEL, ASSY (GF99K)	
1	X-3949-069-1	PANEL ASSY, FRONT (GF90K:PS)	
1	X-3949-070-1	PANEL ASSY, FRONT (GF80)	
1	X-3949-072-1	PANEL ASSY FRONT (GA66)	
1	X-3949-073-1	FRONT PANEL, ASSY (GA70K)	
1	X-3949-076-1	PANEL ASSY, FRONT (GA30:PS)	
1	X-3949-077-1	PANEL ASSY, FRONT (GA30:ME,SG)	
1	X-3949-078-1	PANEL ASSY FRONT (GA77K:PS)	
1	X-3949-081-1	PANEL ASSY FRONT (GA50)	
1	X-3949-084-1	PANEL ASSY FRONT (GA77K:PL)	
1	X-3949-188-1	PANEL ASSY, FRONT (GA77K:TK)	
1	X-3949-189-1	FRONT PANEL, ASSY (GF99K:TK)	
1	X-3949-192-1	FRONT PANEL, ASSY (GA30:TK)	
1	X-3949-193-1	FRONT PANEL, ASSY (GA50:TK)	
1	X-3949-194-1	FRONT PANEL, ASSY (GA70K:TK)	
1	X-3949-195-1	FRONT PANEL, ASSY (GF80:TK)	
1	X-3949-196-1	FRONT PANEL, ASSY (GF90K:TK)	
2	X-3949-088-1	BUTTON ASSY, FUNCTION (GA70K/GA77K/GF80/GF90K/GF99K/PH99)	
2	X-3946-598-1	BUTTON ASSY, FUNCTION (GA30/GA50/GA66/P66)	
3	3-987-176-21	RING,BUTTON (GA70K/GA77K/GF80/GF90K/GF99K/PH99)	
4	3-051-651-01	PLATE, FROSTED(GA66/GF80/GF99K/PH99)	
4	3-051-651-11	PLATE, FROSTED (GA50/GA70K/GA77K:PS/P66)	
4	3-051-651-21	PLATE, FROSTED(GA30/GF90K)	
4	3-051-651-41	PLATE, FROSTED(GA77K:PL)	
5	3-943-995-01	EMBLEM (NO.5), SONY	
6	3-051-653-01	LENS,POWER	
7	3-953-432-01	SPRING (GE), FL	
* 8	A-6794-581-A	FR-140 BOARD, COMPLETE (GA30:ME,PS,SG/GA50:ME,PS,SG/GA66/GA70K:PS/GA77K:PS/GF80:PS/GF90K:PS/GF99K:ME,PS)	
* 8	A-6794-591-A	FR-140 BOARD, COMPLETE (GA77K:PL/GF99K:PL)	
* 8	A-6794-602-A	FR-140 BOARD, COMPLETE (GA30:TK/GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF9OK:TK/GF99K:TK)	
* 9	A-6794-584-A	MJ-91 BOARD, COMPLETE (GA70K:PS/GA77K:PS,PL/GF90K:PS/GF99K:ME,PS,PL)	
* 9	A-6794-605-A	MJ-91 BOARD, COMPLETE (GA70K:TK/GA77K:TK/GF90K:TK/GF99K:TK)	
10	3-710-901-01	SCREW, TAPPING (GA70K/GA77K/GF80/GF90K/GF99K/PH99)	
10	3-710-901-11	SCREW, TAPPING(GA30/GA50/GA66/P66)	
11	3-053-078-11	CASE, UPPER (GA30/GA50/GA66/P66)	
11	3-053-078-31	CASE, UPPER (GA70K/GA77K/GF80/GF90K/GF99K/PH99)	
⚠ 12	1-777-851-41	CORD, POWER	
* 13	A-6794-583-A	FR-142 BOARD, COMPLETE(GF99K:ME,PS)	
* 13	A-6794-587-A	FR-142 BOARD, COMPLETE(GF90K:PS)	
* 13	A-6794-589-A	FR-142 BOARD, COMPLETE(GA77K:PL)	
* 13	A-6794-590-A	FR-142 BOARD, COMPLETE(GF99K:PL)	
* 13	A-6794-592-A	FR-142 BOARD, COMPLETE(GF80:PS/PH99)	
* 13	A-6794-593-A	FR-142 BOARD, COMPLETE(GA77K:PS)	
* 13	A-6794-599-A	FR-142 BOARD, COMPLETE(GA66)	
* 13	A-6794-601-A	FR-142 BOARD, COMPLETE(GA70K)	
* 13	A-6794-604-A	FR-142 BOARD, COMPLETE(GF99K:TK)	
* 13	A-6794-610-A	FR-142 BOARD, COMPLETE(GF90:TK)	
* 13	A-6794-612-A	FR-142 BOARD, COMPLETE(GA50:PS)	
* 13	A-6794-613-A	FR-142 BOARD, COMPLETE(GA50:ME,SG)	
* 13	A-6794-614-A	FR-142 BOARD, COMPLETE(GF80:TK)	
* 13	A-6794-616-A	FR-142 BOARD, COMPLETE(GA30:PS)	
* 13	A-6794-617-A	FR-142 BOARD, COMPLETE(GA30:ME,SG)	
* 13	A-6794-618-A	FR-142 BOARD, COMPLETE(GA77K:TK)	
* 13	A-6794-619-A	FR-142 BOARD, COMPLETE(GA70K:TK)	
* 13	A-6794-621-A	FR-142 BOARD, COMPLETE(GA30:TK)	
* 13	A-6794-637-A	FR-142 BOARD, COMPLETE(GF90K:MJ)	
* 13	A-6794-646-A	FR-142 BOARD, COMPLETE(GA50:TK)	
* 13	A-6794-656-A	FR-142 BOARD, COMPLETE(P66)	
* 14	A-6794-582-A	FR-141 BOARD, COMPLETE (EXCEPT GA30/GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
* 14	A-6794-603-A	FR-141 BOARD, COMPLETE (GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
* 14	A-6794-622-A	FR-141 BOARD, COMPLETE(GA30:TK)	
* 14	A-6794-615-A	FR-141 BOARD, COMPLETE(GA30:ME,PS,SG)	
* 15	A-6794-585-A	JK-166 BOARD, COMPLETE (GA66/GA77K:PL,PS/GF99K:ME,PS,SG)	
* 15	A-6794-588-A	JK-166 BOARD, COMPLETE (GF80/GF90K:PS/PH99)	
* 15	A-6794-606-A	JK-166 BOARD, COMPLETE (GA77K:TK/GF99K:TK)	
* 15	A-6794-611-A	JK-166 BOARD, COMPLETE (GF80:TK/GF90K:TK)	
16	4-921-277-41	SCREW (B2.6X8), TAPPING, BIND	
17	3-051-664-01	WHEEL, ROTARY (GA66/GA70K:PS/GA77K:PL,PS/GF90K:PS/GF99K:ME,PL,PS)	
17	3-051-664-11	WHEEL, ROTARY (GA30:ME,PS,SG/GA50:ME,PS,SG)	
17	3-051-664-21	WHEEL, ROTARY (GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
17	3-051-664-31	WHEEL, ROTARY(GA30:TK/GA50:TK)	
18	3-051-663-01	KNOB, ROTARY (GA66/GA70K:PS/GA77K:PL,PS/GF90K:PS/GF99K:ME,PL,PS)	
18	3-051-663-21	KNOB, ROTARY (GA70K:TK/GA77K:TK/GF9OK:TK/GF99K:TK)	
19	3-051-662-01	KNOB, SLIDE (GA66/GA70K:PS/GA77K:PL,PS/GF90K:PS/GF99K:ME,PL,PS)	
19	3-051-662-11	KNOB, SLIDE (GA30:ME,PS,SG/GA50:ME,PS,SG)	
19	3-051-662-21	KNOB, SLIDE (GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
19	3-051-662-31	KNOB, SLIDE(GA30:TK/GA50:TK)	
20	3-970-608-21	SUMITITE (B3), +BV	
21	1-790-118-11	CABLE, FLAT (FJK-1) (GA66/GA70K/GA77K/GF80/GF90K/GF99K/PH99)	
22	1-790-119-11	CABLE, FLAT (FFR-6)	
23	1-790-120-11	CABLE, FLAT (FFR-7)	
24	1-418-060-11	COMMANDER, STANDARD (RMT-V254) (EXCEPT GA30)	
24	1-418-060-21	COMMANDER, STANDARD(RMT-V254A)(GA30)	
25	3-709-269-01	LID, BATTERY CASE (FOR REMOTE COMMANDER)	

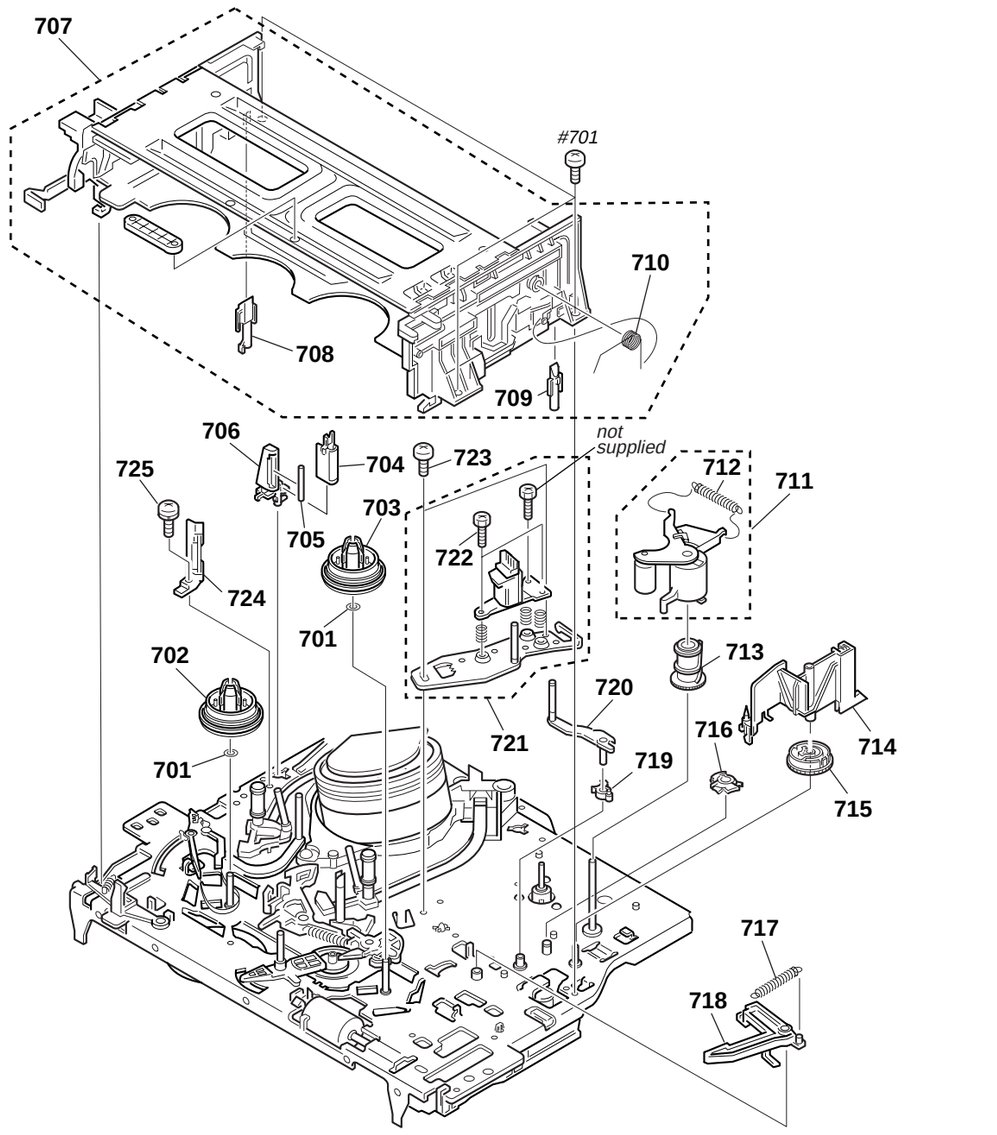
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

7-1-2. CHASSIS SECTION



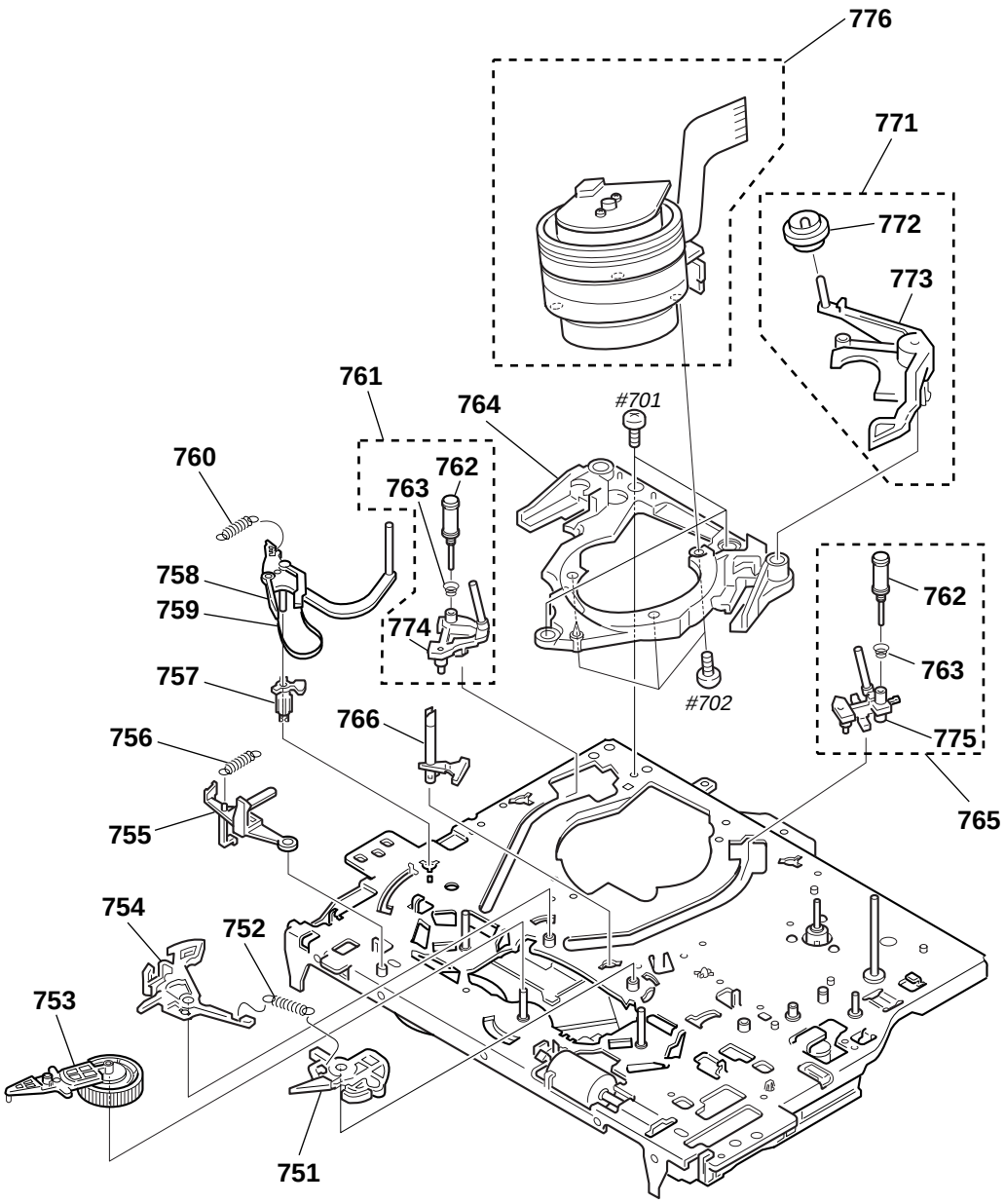
Ref. No.	Part No.	Description	Remarks
* 51	3-959-383-01	BASE (R), MD	
* 52	A-6794-586-A	SR-35 BOARD, COMPLETE (GA77K:PS,PL/GF99K:PS)	
* 52	A-6794-600-A	SR-35 BOARD, COMPLETE(GA66)	
* 52	A-6794-607-A	SR-35 BOARD, COMPLETE (GA77K:TK/GF99K:TK)	
* 53	A-6791-702-A	MA-336 BOARD, COMPLETE(GF99K:ME,PS)	
* 53	A-6791-703-A	MA-336 BOARD, COMPLETE(GF90K:PS)	
* 53	A-6791-704-A	MA-336 BOARD, COMPLETE(GF80:PS/PH99)	
* 53	A-6791-705-A	MA-336 BOARD, COMPLETE(GA77K:PL)	
* 53	A-6791-706-A	MA-336 BOARD, COMPLETE(GF99K:PL)	
* 53	A-6791-707-A	MA-336 BOARD, COMPLETE(GA77K:PS)	
* 53	A-6791-710-A	MA-336 BOARD, COMPLETE(GA66)	
* 53	A-6791-711-A	MA-336 BOARD, COMPLETE(GA70K)	
* 53	A-6791-712-A	MA-336 BOARD, COMPLETE(GF99K:TK)	
* 53	A-6791-715-A	MA-336 BOARD, COMPLETE(GF90K:TK)	
* 53	A-6791-716-A	MA-336 BOARD, COMPLETE(GF80:TK)	
* 53	A-6791-717-A	MA-336 BOARD, COMPLETE(GA50:PS)	
* 53	A-6791-718-A	MA-336 BOARD, COMPLETE(GA50:ME,SG)	
* 53	A-6791-719-A	MA-336 BOARD, COMPLETE(GA30:PS)	
* 53	A-6791-720-A	MA-336 BOARD, COMPLETE(GA30:ME,SG)	
* 53	A-6791-721-A	MA-336 BOARD, COMPLETE(GA77K:TK)	
* 53	A-6791-722-A	MA-336 BOARD, COMPLETE(GA70K:TK)	
* 53	A-6791-724-A	MA-336 BOARD, COMPLETE(GA30:TK)	
* 53	A-6791-729-A	MA-336 BOARD, COMPLETE(GA50:TK)	
* 53	A-6791-744-A	MA-336 BOARD, COMPLETE(P66)	
54	3-970-608-21	SUMITITE (B3), +BV	
55	3-052-070-01	PANEL (M) REAR (GA50:ME,PS,SG/GA66/GA70K:PS/GA77K:PS/ GF80:PS/GF90K:PS/GF99K:ME,PS/P66/PH99)	
55	3-052-070-21	PANEL (M) REAR(GA30:ME,PS,SG)	
55	3-052-070-31	PANEL (M) REAR(GA77K:PL/GF99K:PL)	
55	3-052-070-51	PANEL (M) REAR (GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
55	3-052-070-61	PANEL (M) REAR(GA50:TK/GA70K:TK)	
55	3-052-070-71	PANEL (M) REAR(GA30:TK)	
56	1-790-117-11	CABLE, FLAT (FDM-5)	
57	3-987-560-02	PLATE, TOP, FL	

7-1-3. MECHANISM DECK SECTION-1



Ref. No.	Part No.	Description	Remarks
701	3-977-509-01	WASHER, THRUST	
702	3-977-507-01	TABLE, REEL (S)	
703	3-977-508-01	TABLE, REEL (T)	
704	1-500-144-11	HEAD, FE	
705	3-977-495-01	SHAFT TG2	
706	3-977-494-01	HOLDER, FEH	
707	A-6759-619-B	FLCOMPLETE ASSY	
708	3-977-535-01	PLATE, LUMINOUS(END SENSOR)	
709	3-977-536-01	PLATE, LUMINOUS(TOP SENSOR)	
710	3-970-471-01	SPRING (DECK OPEN), TORSION	
711	A-6759-615-A	PRESS BLOCK ASSY, PINCH	
712	3-958-455-01	SPRING (PINCH), TENSION	
713	3-977-447-01	GEAR, ELEVATOR	
714	3-977-514-01	OPENER, LID	
715	3-977-441-01	GEAR, PINCH PRESSING	
716	3-977-445-01	GEAR, TG8 ARM DRIVING	
717	3-977-465-01	SPRING,EXTENSION(RVS BRAKE)	
718	X-3947-582-1	ARMASSY, RVS BRAKE	
719	3-977-446-01	GEAR, TG8 ARM	
720	X-3947-590-1	TG8ASSY	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
722	3-974-556-01	+HEXA TT 2.6X9 (TAPER)	
723	3-979-508-01	SCREW +HEXA TP SW 3X8	
724	X-3947-568-1	TC(N17S) ASSY	
725	3-979-112-01	SCREW SW(+)BVTP 3X10	

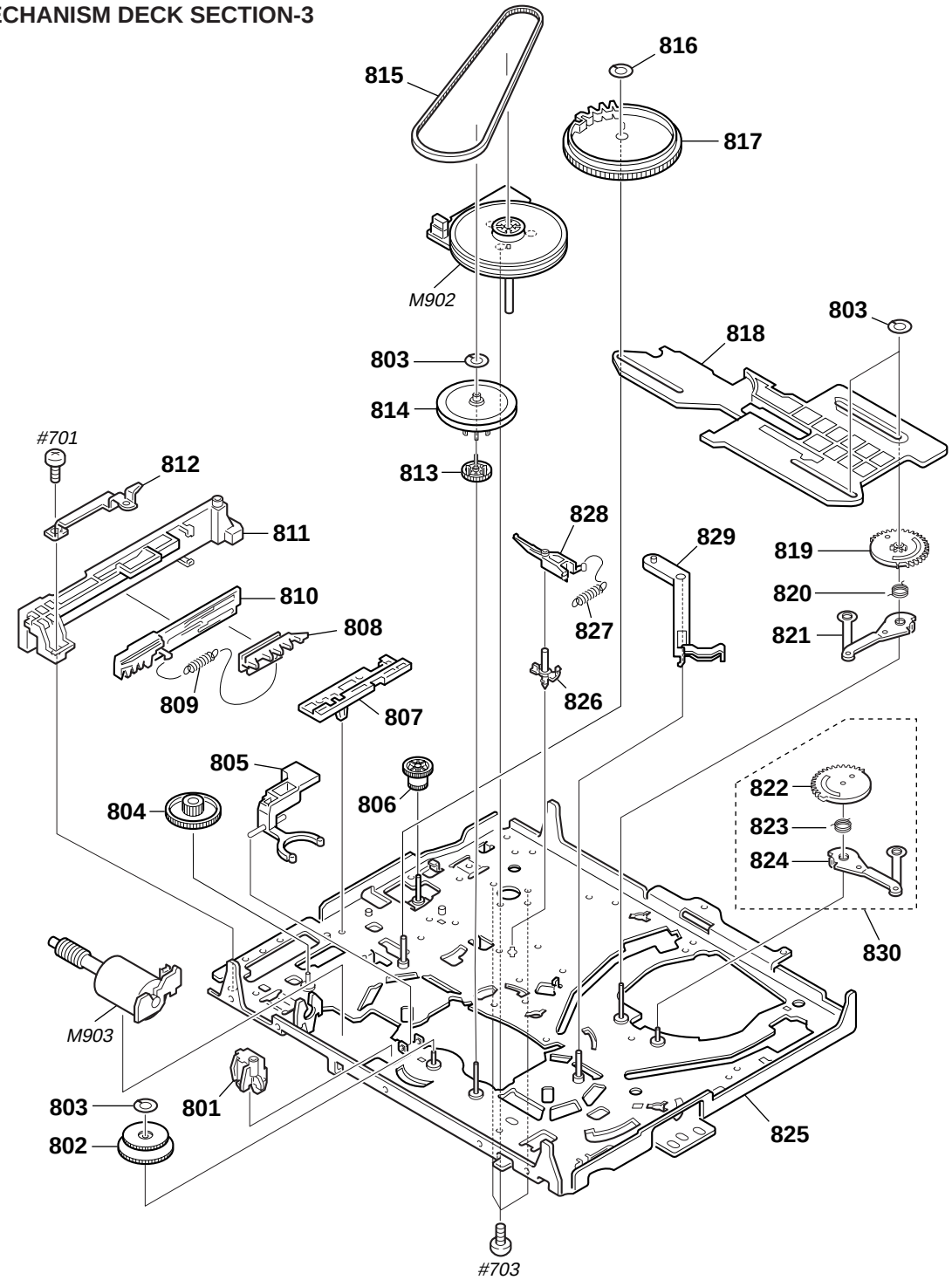
7-1-4. MECHANISM DECK SECTION-2



Ref. No.	Part No.	Description	Remarks
751	X-3947-581-1	BRAKE ASSY,MAIN(T)	
752	3-977-462-01	SPRING,EXTENTION. (MAIN BRAKE)	
753	X-3947-573-1	ARMASSY, PENDULUM	
754	X-3947-580-2	BRAKE ASSY, MAIN(S)	
755	3-977-513-02	LEVER, REC. PROOF	
756	3-976-767-01	SPRING, TENS. (REC. PROOF)	
757	3-977-487-01	BOSS, TG1 FULCRUM	
758	X-3947-587-1	TG1ASSY	
759	X-3947-589-1	BAND ASSY, TG1	
760	3-977-488-01	SPRING (POWER TENSION)	
761	A-6750-324-A	SHUTTLE (S) BLOCK ASSY	
762	X-3944-378-1	ROLLER ASSY, GUIDE	
763	3-965-178-01	SPRING	
764	3-969-632-04	BASE, DRUM	
765	A-6750-328-E	SHUTTLE (T) BLOCK ASSY	

Ref. No.	Part No.	Description	Remarks
766	3-977-501-01	PLATE, LUMINOUS	
771	A-6746-074-G	ROLLER BLOCK ASSY, HC	
772	X-3947-255-1	ROLLER ASSY, HC	
773	3-975-724-07	ARM, HC	
774	X-3946-855-1	SHUTTLE (S) ASSY	
775	X-3946-856-1	SHUTTLE (T) ASSY	
776	1-759-183-11	DRUM ASSY, DZH-78A-R (GA30:PS,TK/GA50:PS,TK/GA70K:PS,TK/GA77K:PS,TK/P66)	
776	1-759-449-11	DRUM ASSY, DZH-91A-R (GF80:PS,TK/GF90K:PS,TK/GF99K:ME,PS,TK/PH99)	
776	1-759-451-11	DRUM ASSY, DZH-90A-R(GF99K:PL)	
776	1-759-453-11	DRUM ASSY, DZH-89A-R (GA30:SG,ME/GA50:SG,ME/GA66:ME)	
776	1-759-455-11	DRUM ASSY, DZH-71D-R(GA77K:PL)	

7-1-5. MECHANISM DECK SECTION-3



Ref. No.	Part No.	Description	Remarks
801	3-977-437-01	RETAINER,CAM MOTOR	
802	X-3947-584-1	ASSY, REEL DIRECT	
803	3-977-443-01	WASHER, STOPPER	
804	3-977-438-01	WORM - WHEEL	
805	3-977-506-01	ARM, LIMITTER SELECTION	
806	3-977-444-01	GEAR, PINCH TRANSMISSION	
807	3-977-515-01	GUIDE, FL SLIDER	
808	3-977-517-01	PLATE, SLIDE, FL	
809	3-977-519-01	SPRING, TENS. (LIMIT, FL)	
810	3-977-518-02	PLATE, LIMITTER, FL	
811	3-977-516-01	HOLDER, FL SLIDER	
812	3-977-877-01	PLATE, RETAINER	
813	3-977-504-01	GEAR, CLUTCH	
814	X-3947-585-1	GEAR ASSY, PULLEY	
815	3-977-510-01	BELT, RUBBER	
816	3-977-440-01	WASHER, STOPPER	

Ref. No.	Part No.	Description	Remarks
817	3-977-439-01	GEAR, CAM	
818	3-977-442-01	SLIDER	
819	3-977-455-01	GEAR, LOADING(T)	
820	3-977-456-03	SPRING, TORSION (LOAD T)	
821	X-3947-579-1	LEVER ASSY, LOADING(T)	
822	3-977-451-01	GEAR, LOADING(S)	
823	3-977-452-01	SPRING, TORSION (LOAD S)	
824	X-3947-578-1	LEVER ASSY, LOADING(S)	
825	X-3947-576-2	CHASSIS ASSY, MECHANICAL	
826	3-977-468-01	SHAFT, CAPSTAN BRAKE	
827	3-977-467-02	SPRING, CAP BRAKE	
828	X-3947-583-1	BRAKE ASSY, CAPSTAN	
829	3-977-489-01	ARM, TG1 DRIVING	
830	A-6759-616-A	GEAR BLOCK ASSY, LOADING(S)	
M902	1-698-971-11	MOTOR, DC(CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

7-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... , uPB... , µPB... , uPC... , µPC... , uPD..., µPD...
- Abbreviation
  SG: Gulf Model
  EE: East European Model
  PS: Pan Asia Model
  PL: Philippine Model
  TK: Thai Model

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remarks
*	A-6794-581-A	FR-140BOARD, COMPLETE ********** (GA30:ME,PS,SG/GA50:ME,PS,SG/GA66/GA70K:PS/GA77K:PS/GF80:PS/GF90K:PS/GF99K:ME,PS)	
*	A-6794-591-A	FR-140BOARD, COMPLETE ********** (GA77K:PL/GF99K:PL)	
*	A-6794-602-A	FR-140BOARD, COMPLETE ********** (GA30:TK/GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
		(Ref.No.:1,000 Series)	
		< CONNECTOR >	
* CN605	1-564-004-11	PIN, CONNECTOR 5P	
		< DIODE >	
D601	8-719-064-11	DIODE SPR-325MVW	
		< TRANSISTOR >	
Q601	8-729-901-06	TRANSISTOR DTA144EK	
Q602	8-729-421-19	TRANSISTOR UN2213 (EXCEPT GA77K:PL/GF99K:PL)	
		< RESISTOR >	
R601	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R602	1-216-035-00	METAL CHIP 270 5% 1/10W	
R640	1-216-035-00	METAL CHIP 270 5% 1/10W (EXCEPT GA77K:PL/GF99K:PL)	
R641	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
		< SWITCH >	
S601	1-571-977-11	SWITCH, TACTIL (ON/STANDBY)	
S602	1-571-977-11	SWITCH, TACTIL (EJECT)	
*	A-6794-582-A	FR-141BOARD, COMPLETE ********** (EXCEPT GA30/GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
*	A-6794-603-A	FR-141BOARD, COMPLETE ********** (GA50:TK/GA70K:TK/GA77K:TK/GF80:TK/GF90K:TK/GF99K:TK)	
*	A-6794-615-A	FR-141BOARD, COMPLETE (GA30:ME,PS,SG) **********	
*	A-6794-622-A	FR-141BOARD, COMPLETE (GA30:TK) **********	
		(Ref.No.:1,000 Series)	
		< DIODE >	
D602	8-719-045-62	DIODE SLR-342VC-A-47 (EXCEPT GA30)	
		< CONNECTOR >	
* CN604	1-564-005-11	PIN, CONNECTOR 6P	
		< RESISTOR >	
R606	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R607	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R616	1-216-063-91	RES,CHIP 3.9K 5% 1/10W	
R642	1-216-035-00	METAL CHIP 270 5% 1/10W (EXCEPT GA30)	
		< SWITCH >	
S606	1-571-977-11	SWITCH, TACTIL (STOP)	
S607	1-571-977-11	SWITCH, TACTIL (PLAY)	
S608	1-571-977-11	SWITCH, TACTIL (FF)	
S609	1-571-977-11	SWITCH, TACTIL (REW)	
S620	1-571-977-11	SWITCH, TACTIL (SYNCHRO REC) (EXCEPT GA30)	
*	A-6794-583-A	FR-142BOARD, COMPLETE (GF99K:ME,PS) **********	
*	A-6794-587-A	FR-142BOARD, COMPLETE (GF90K:PS) **********	
*	A-6794-589-A	FR-142BOARD, COMPLETE (GA77K:PL) **********	
*	A-6794-590-A	FR-142BOARD, COMPLETE (GF99K:PL) **********	
*	A-6794-592-A	FR-142BOARD, COMPLETE (GF80:PS/PH99) **********	
*	A-6794-593-A	FR-142BOARD, COMPLETE (GA77K:PS) **********	
*	A-6794-599-A	FR-142BOARD, COMPLETE (GA66) **********	

FR-142

Ref. No.	Part No.	Description	Remarks
*	A-6794-601-A	FR-142BOARD, COMPLETE (GA70K:PS) **********	
*	A-6794-604-A	FR-142BOARD, COMPLETE (GF99K:TK) **********	
*	A-6794-610-A	FR-142BOARD, COMPLETE (GF90:TK) **********	
*	A-6794-612-A	FR-142BOARD, COMPLETE (GA50:PS) **********	
*	A-6794-613-A	FR-142BOARD, COMPLETE (GA50:ME,SG) **********	
*	A-6794-614-A	FR-142BOARD, COMPLETE (GF80:TK) **********	
*	A-6794-616-A	FR-142BOARD, COMPLETE (GA30:PS) **********	
*	A-6794-617-A	FR-142BOARD, COMPLETE (GA30:ME,SG) **********	
*	A-6794-618-A	FR-142BOARD, COMPLETE (GA77K:TK) **********	
*	A-6794-619-A	FR-142BOARD, COMPLETE (GA70K:TK) **********	
*	A-6794-621-A	FR-142BOARD, COMPLETE (GA30:TK) **********	
*	A-6794-646-A	FR-142BOARD, COMPLETE (GA50:TK) **********	
*	A-6794-656-A	FR-142BOARD, COMPLETE (P66) **********	
			(Ref.No.:1,000 Series)
		< CAPACITOR >	
C505	1-126-157-11	ELECT 10uF 20% 16V	(GA70K/GA77K/GF90K/GF99K)
C506	1-164-159-21	CERAMIC 0.1uF 50V	(GA70K/GA77K/GF90K/GF99K)
C509	1-126-157-11	ELECT 10uF 20% 16V	(GA70K/GA77K/GF90K/GF99K)
C601	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
		< CONNECTOR >	
CN502	1-506-469-11	PIN, CONNECTOR 4P	(GA70K/GA77K/GF90K/GF99K)
CN601	1-691-047-21	HOUSING, CONNECTOR 15P	
CN602	1-569-930-11	HOUSING, CONNECTOR 13P	
		< DIODE >	
D501	8-719-991-33	DIODE 1SS133T-77	(GA40K/GA70K/GA77K/GF90K/GF99K)
D502	8-719-991-33	DIODE 1SS133T-77	(GA40K/GA70K/GA77K/GF90K/GF99K)
D503	8-719-991-33	DIODE 1SS133T-77	(GA40K/GA70K/GA77K/GF90K/GF99K)
D603	8-719-056-07	DIODE SLR-342MC3F	
D604	8-719-056-07	DIODE SLR-342MC3F	
D605	8-719-056-07	DIODE SLR-342MC3F	
D606	8-719-056-07	DIODE SLR-342MC3F	
D607	8-719-056-07	DIODE SLR-342MC3F	
D608	8-719-045-62	DIODE SLR-342VC-A-47(EXCEPT GA30)	
D609	8-719-056-07	DIODE SLR-342MC3F	
D610	8-719-056-07	DIODE SLR-342MC3F	(GF80/GF90K/GF99K/PH99)
D611	8-719-056-07	DIODE SLR-342MC3F	(GF80/GF90K/GF99K/PH99)
D612	8-719-056-07	DIODE SLR-342MC3F	(GF80/GF90K/GF99K/PH99)
D613	8-719-056-07	DIODE SLR-342MC3F(GA77K:PL/GF99K:PL)	
D614	8-719-056-07	DIODE SLR-342MC3F(GA66/GA77K/GF99K)	
D615	8-719-056-07	DIODE SLR-342MC3F	
D616	8-719-056-07	DIODE SLR-342MC3F	
		< IC >	
IC601	8-749-011-03	IC GP1U26X	
		< JUMPER RESISTOR >	
JR072	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR073	1-216-295-00	METAL CHIP 0 5% 1/10W	
JR074	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR075	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR076	1-216-296-00	METAL CHIP 0 5% 1/8W	
JR077	1-216-296-00	METAL CHIP 0 5% 1/8W	
		< JUMPER RESISTOR >	
JS510	1-216-295-00	METAL CHIP 0 5% 1/10W	(GA66/GA77K/GF90K/GF99K)
JS511	1-216-295-00	METAL CHIP 0 5% 1/10W	(GA70K)
		< RESISTOR >	
R520	1-216-081-00	METAL CHIP 22K 5% 1/10W	(GA70K/GA77K/GF90K/GF99K)
R521	1-216-081-00	METAL CHIP 22K 5% 1/10W	(GA70K/GA77K/GF90K/GF99K)
R522	1-216-035-00	METAL CHIP 270 5% 1/10W	(GA70K/GA77K/GF90K/GF99K)
R524	1-216-073-00	METAL CHIP 10K 5% 1/10W	(GA70K/GA77K/GF90K/GF99K)
R603	1-216-075-00	METAL CHIP 12K 5% 1/10W	(EXCEPT GA77K:PL/GF99K:PL)
R604	1-216-085-00	METAL CHIP 33K 5% 1/10W	(GA50:ME,SG/GA66/GA77K:PL/GF99K:PL)
R605	1-216-075-00	METAL CHIP 12K 5% 1/10W	(EXCEPT GA30:PL/GA40K/GA77K:PL/GF99K:PL)
R608	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R609	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	
R610	1-216-085-00	METAL CHIP 33K 5% 1/10W	(GA30/GA50:ME,SG/P66)
R611	1-216-085-00	METAL CHIP 33K 5% 1/10W	(GA50:PS,TK/GA66/GA70K/GA77K:PS,TK/GF80/GF90K/GF99K:ME,PS,TK/PH99)
R612	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R613	1-216-063-91	RES,CHIP 3.9K 5% 1/10W	
R614	1-216-067-00	METAL CHIP 5.6K 5% 1/10W	(GA50:ME,SG/GA66/GA77K:PL/GF99K:PL)
R615	1-216-295-00	METAL CHIP 0 5% 1/10W	

Ref. No.	Part No.	Description			Remarks
R618	1-216-035-00	METAL CHIP	270	5%	1/10W
R619	1-216-035-00	METAL CHIP	270	5%	1/10W (EXCEPT GA30)
R620	1-216-198-91	RES,CHIP	1K	5%	1/8W
R621	1-216-035-00	METAL CHIP	270	5%	1/10W (GF80/GF90K/GF99K/PH99)
R622	1-216-035-00	METAL CHIP	270	5%	1/10W (GF80/GF90K/GF99K/PH99)
R623	1-216-198-91	RES,CHIP	1K	5%	1/8W (GF80/GF90K/GF99K/PH99)
R624	1-216-035-00	METAL CHIP	270	5%	1/10W (GA77K:PL/GF99K:PL)
R625	1-216-035-00	METAL CHIP	270	5%	1/10W (GA66/GA77K/GF99K)
R626	1-216-035-00	METAL CHIP	270	5%	1/10W
R627	1-216-035-00	METAL CHIP	270	5%	1/10W
R628	1-216-230-00	RES,CHIP	22K	5%	1/8W (GA66/GA77K/GF80/GF90K/GF99K/PH99)
R629	1-216-035-00	METAL CHIP	270	5%	1/10W
R630	1-216-035-00	METAL CHIP	270	5%	1/10W
R631	1-216-035-00	METAL CHIP	270	5%	1/10W
R632	1-216-035-00	METAL CHIP	270	5%	1/10W
R633	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R634	1-216-085-00	METAL CHIP	33K	5%	1/10W (EXCEPT GA77K:PL/GF99K:PL)
R635	1-216-234-00	RES,CHIP	33K	5%	1/8W (GA66/GA77K/GF80/GF90K/GF99K/PH99)
R636	1-216-085-00	METAL CHIP	33K	5%	1/10W (GA50:ME,SG/GA66/GA77K:PL/GF99K:PL)
R637	1-216-073-00	METAL CHIP	10K	5%	1/10W (EXCEPT GF77K:PL/GF99K:PL)
		< VARIABLE RESISTOR >			
RV501	1-223-914-11	RES, VAR, CARBON 10K(ECHO) (GA70K/GA77K/GF90K/GF99K)			
RV502	1-223-914-11	RES, VAR, CARBON 10K(MIC VOL 1) (GA70K/GA77K/GF90K/GF99K)			
RV503	1-223-914-11	RES, VAR, CARBON 10K(MIC VOL 2) (GA70K/GA77K/GF90K/GF99K)			
		< SWITCH >			
S501	1-572-907-11	SWITCH, SLIDE(KARAOKE) (GA77K/GF90K/GF99K)			
S501	1-572-908-11	SWITCH, SLIDE(KARAOKE)(GA70K)			
S603	1-571-977-11	SWITCH, TACTIL(VIRTUAL SURROUND) (GA66/GA77K/GF99K)			
S605	1-572-907-11	SWITCH, SLIDE(COLOR SYSTEM) (EXCEPT GA77K:PL/GF99K:PL)			
S610	1-572-907-11	SWITCH, SLIDE(NTSC PB) (GA50:PS,TK/GA66/GA70K/GA77K/GF80/GF90K/GF99K:ME,PS,TK)			
S610	1-572-908-11	SWITCH, SLIDE(NTSC PB)(GA50:ME,SG/P66)			
S611	1-571-977-11	SWITCH, TACTIL(AUTO/MANUAL)			
S612	1-571-977-11	SWITCH, TACTIL(ON SCREEN DISPLAY)			
S613	1-418-059-11	ENCODER, ROTARY(PICTURE CONTROL)			
S614	1-572-908-11	SWITCH, SLIDE(TAPE SPEED) (GA50:ME,SG/GA66/GA77K:PL/GF99K:PL)			
S615	1-572-908-11	SWITCH, SLIDE(INPUT SELECT) (GA66/GA77K/GF80/GF90K/GF99K/PH99)			

Ref. No.	Part No.	Description			Remarks
*	A-6794-585-A	JK-166BOARD, COMPLETE ********** (GA66/GA77K:PL,PS/GF99K:ME,PL,PS)			
*	A-6794-588-A	JK-166BOARD, COMPLETE ********** (GF80:PS/GF90K:PS/PH99)			
*	A-6794-606-A	JK-166BOARD, COMPLETE ********** (GA77K:TK/GF99K:TK)			
*	A-6794-611-A	JK-166BOARD, COMPLETE ********** (GF80:TK/GF90K:TK)			
		(Ref.No.:2,000 Series)			
	3-051-657-01	JACKHOLDER, PIN			
		< CONNECTOR >			
CN651	1-691-043-21	HOUSING, CONNECTOR 11P			
		< JACK >			
CNJ651	1-785-606-11	JACK, PIN 3P(LINE-2 IN)			
CNJ652	1-785-606-11	JACK, PIN 3P(LINE-2 OUT) (GA66/GA77K/GF99K)			
		< DIODE >			
D640	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF99K)		
D641	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF99K)		
D642	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF99K)		
D643	8-719-108-12	DIODE	RD9.1E-W		
D644	8-719-108-12	DIODE	RD9.1E-W		
D645	8-719-108-12	DIODE	RD9.1E-W		
D651	8-719-988-62	DIODE	1SS355		
D652	8-719-988-62	DIODE	1SS355		
		< JUMPER RESISTOR >			
JR651	1-216-296-00	METAL CHIP	0	5%	1/8W
JR652	1-216-296-00	METAL CHIP	0	5%	1/8W
JR653	1-216-296-00	METAL CHIP	0	5%	1/8W
JR654	1-216-296-00	METAL CHIP	0	5%	1/8W
JR655	1-216-296-00	METAL CHIP	0	5%	1/8W
JR656	1-216-296-00	METAL CHIP	0	5%	1/8W
		< RESISTOR >			
R651	1-216-041-00	METAL CHIP	470	5%	1/10W (GA66/GA77K/GF99K)
R652	1-216-041-00	METAL CHIP	470	5%	1/10W (GA66/GA77K/GF99K)
R653	1-216-023-00	METAL CHIP	82	5%	1/10W

MA-336

Ref. No.	Part No.	Description	Remarks
*	A-6791-702-A	MA-336BOARD, COMPLETE (GF99K:ME,PS)	
		**********	
*	A-6791-703-A	MA-336BOARD, COMPLETE (GF90K:PS)	
		**********	
*	A-6791-704-A	MA-336BOARD, COMPLETE (GF80:PS/PH99)	
		**********	
*	A-6791-705-A	MA-336BOARD, COMPLETE (GA77K:PL)	
		**********	
*	A-6791-706-A	MA-336BOARD, COMPLETE (GF99K:PL)	
		**********	
*	A-6791-707-A	MA-336BOARD, COMPLETE (GA77K:PS)	
		**********	
*	A-6791-710-A	MA-336BOARD, COMPLETE (GA66)	
		**********	
*	A-6791-711-A	MA-336BOARD, COMPLETE (GA70K:PS)	
		**********	
*	A-6791-712-A	MA-336BOARD, COMPLETE (GF99K:TK)	
		**********	
*	A-6791-715-A	MA-336BOARD, COMPLETE (GF90K:TK)	
		**********	
*	A-6791-716-A	MA-336BOARD, COMPLETE (GF80:TK)	
		**********	
*	A-6791-717-A	MA-336BOARD, COMPLETE (GA50:PS)	
		**********	
*	A-6791-718-A	MA-336BOARD, COMPLETE (GA50:ME,SG)	
		**********	
*	A-6791-719-A	MA-336BOARD, COMPLETE (GA30:PS)	
		**********	
*	A-6791-720-A	MA-336BOARD, COMPLETE (GA30:ME,SG)	
		**********	
*	A-6791-721-A	MA-336BOARD, COMPLETE (GA77K:TK)	
		**********	
*	A-6791-722-A	MA-336BOARD, COMPLETE (GA70:TK)	
		**********	
*	A-6791-724-A	MA-336BOARD, COMPLETE (GA30:TK)	
		**********	
*	A-6791-729-A	MA-336BOARD, COMPLETE (GA50:TK)	
		**********	
*	A-6791-744-A	MA-336BOARD, COMPLETE (P66)	
		**********	

(Ref.No.:1,000 Series)

< CAPACITOR >

Ref. No.	Part No.	Description			Remarks
C100	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C101	1-126-162-11	ELECT	3.3uF	20%	50V
C102	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C103	1-124-584-00	ELECT	100uF	20%	10V
C104	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C105	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C106	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C107	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C108	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C109	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C110	1-126-160-11	ELECT	1uF	20%	50V
C111	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C112	1-124-257-00	ELECT	2.2uF	20%	50V
C113	1-124-465-00	ELECT	0.47uF	20%	50V
C114	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C115	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C116	1-126-163-11	ELECT	4.7uF	20%	50V
C118	1-163-222-11	CERAMIC CHIP	5PF	0.25PF	50V
C119	1-126-163-11	ELECT	4.7uF	20%	50V
C120	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C121	1-124-584-00	ELECT	100uF	20%	10V
C122	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C123	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C124	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C125	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C126	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C127	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C128	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C129	1-124-584-00	ELECT	100uF	20%	10V
C130	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C131	1-163-263-11	CERAMIC CHIP	330PF	5%	50V
C132	1-126-160-11	ELECT	1uF	20%	50V (EXCEPT GA30)
C133	1-126-160-11	ELECT	1uF	20%	50V (GA66/GA77K/GF80/GF90K/GF99K/PH99)
C134	1-124-584-00	ELECT	100uF	20%	10V
C135	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C136	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C137	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C138	1-163-233-11	CERAMIC CHIP	18PF	5%	50V (GA77K:PL/GF99K:PL)
C138	1-163-235-11	CERAMIC CHIP	22PF	5%	50V (EXCEPT GA77K:PL/GF99K:PL)
C139	1-163-237-11	CERAMIC CHIP	27PF	5%	50V (GA77K:PL/GF99K:PL)
C140	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C141	1-164-232-11	CERAMIC CHIP	0.01uF		50V (GA30/GA50/GA70K/P66)
C142	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C143	1-126-157-11	ELECT	10uF	20%	16V
C144	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C145	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C146	1-126-162-11	ELECT	3.3uF	20%	50V
C147	1-126-157-11	ELECT	10uF	20%	16V
C148	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C149	1-124-257-00	ELECT	2.2uF	20%	50V
C150	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C151	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C152	1-163-235-11	CERAMIC CHIP	22PF	5%	50V (GA77K:PL/GF99K:PL)
C152	1-163-241-11	CERAMIC CHIP	39PF	5%	50V (EXCEPT GA77K:PL/GF99K:PL)
C153	1-163-235-11	CERAMIC CHIP	22PF	5%	50V (GA77K:PL/GF99K:PL)

Ref. No.	Part No.	Description			Remarks
C153	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
			(EXCEPT GA77K:PL/GF99K:PL)		
C155	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C160	1-163-038-00	CERAMIC CHIP	0.1uF		25V
			(EXCEPT GA77K:PL/GF99K:PL)		
C200	1-163-063-91	CERAMIC CHIP	0.022uF	10%	50V
C201	1-164-346-11	CERAMIC CHIP	1uF		16V
C202	1-163-243-11	CERAMIC CHIP	47PF	5%	50V
C203	1-126-157-11	ELECT	10uF	20%	16V
C204	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C205	1-124-584-00	ELECT	100uF	20%	10V
C206	1-124-234-00	ELECT	22uF	20%	16V
C207	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C208	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C209	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C210	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C211	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C212	1-126-163-11	ELECT	4.7uF	20%	50V
C213	1-126-157-11	ELECT	10uF	20%	16V
C214	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C215	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C216	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C217	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C219	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C221	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C223	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C224	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C227	1-124-589-11	ELECT	47uF	20%	16V
C229	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C232	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C233	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C234	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C235	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C236	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C237	1-124-589-11	ELECT	47uF	20%	16V
C240	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C241	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C242	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C243	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C244	1-124-589-11	ELECT	47uF	20%	16V
C245	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C250	1-126-935-11	ELECT	470uF	20%	16V
C251	1-124-584-00	ELECT	100uF	20%	10V
C252	1-124-589-11	ELECT	47uF	20%	16V
C254	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C255	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C256	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C257	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C259	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C260	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C261	1-124-584-00	ELECT	100uF	20%	10V
C262	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C263	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C264	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
		(GA30:PS,TK/GA50PS,TK/GA70K/GA77K:PS,TKG/F80/GF90K:PS,TK/GF99K:ME,PS,TK/P66/PH99)			
C264	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
		(GA30:ME,SG/GA50:ME,SG/GA66/GA77K:PL/GF99K:PL)			

Ref. No.	Part No.	Description			Remarks
C265	1-163-241-11	CERAMIC CHIP	39PF	5%	50V
C266	1-164-346-11	CERAMIC CHIP	1uF		16V
			(EXCEPT GA77K:PL/GF99K:PL)		
C267	1-163-245-11	CERAMIC CHIP	56PF	5%	50V
			(EXCEPT GA77K:PL/GF99K:PL)		
C268	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C290	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C298	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C300	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
			(GF80/GF90K/GF99K/PH99)		
C301	1-164-232-11	CERAMIC CHIP	0.01uF		50V
			(GF80/GF90K/GF99K/PH99)		
C302	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C304	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C305	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
			(GF80/GF90K/GF99K/PH99)		
C307	1-164-232-11	CERAMIC CHIP	0.01uF		50V
			(GF80/GF90K/GF99K/PH99)		
C308	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C309	1-164-232-11	CERAMIC CHIP	0.01uF		50V
			(GF80/GF90K/GF99K/PH99)		
C310	1-163-038-00	CERAMIC CHIP	0.1uF		25V
			(GF80/GF90K/GF99K/PH99)		
C311	1-124-589-11	ELECT	47uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C312	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C313	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C314	1-163-038-00	CERAMIC CHIP	0.1uF		25V
			(GF80/GF90K/GF99K/PH99)		
C315	1-124-589-11	ELECT	47uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C316	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C317	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
			(GF80/GF90K/GF99K/PH99)		
C319	1-124-589-11	ELECT	47uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C321	1-126-157-11	ELECT	10uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C323	1-124-257-00	ELECT	2.2uF	20%	50V
			(GF80/GF90K/GF99K/PH99)		
C325	1-126-157-11	ELECT	10uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C326	1-124-589-11	ELECT	47uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C327	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
			(GF80/GF90K/GF99K/PH99)		
C328	1-126-157-11	ELECT	10uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C331	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
			(GF80/GF90K/GF99K/PH99)		
C332	1-126-160-11	ELECT	1uF	20%	50V
			(GF80/GF90K/GF99K/PH99)		
C333	1-126-157-11	ELECT	10uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C334	1-126-157-11	ELECT	10uF	20%	16V
			(GF80/GF90K/GF99K/PH99)		
C351	1-126-157-11	ELECT	10uF	20%	16V
			(EXCEPT GA30/GA50/GA70K/P66)		
C352	1-126-157-11	ELECT	10uF	20%	16V
			(EXCEPT GA30/GA50/GA70K/P66)		

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Ref. No.	Part No.	Description				Remarks
C400	1-126-157-11	ELECT	10uF	20%	16V	
C401	1-124-584-00	ELECT	100uF	20%	10V	
C402	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C403	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V	
C404	1-124-234-00	ELECT	22uF	20%	16V	
C405	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	
C406	1-126-163-11	ELECT	4.7uF	20%	50V	
C407	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V	(GA77K:PL/GF99K:PL)
C407	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V	(EXCEPT GA77K:PL/GF99K:PL)
C408	1-126-163-11	ELECT	4.7uF	20%	50V	
C409	1-126-157-11	ELECT	10uF	20%	16V	
C410	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C412	1-126-160-11	ELECT	1uF	20%	50V	(EXCEPT GA30)
C413	1-124-234-00	ELECT	22uF	20%	16V	
C414	1-126-163-11	ELECT	4.7uF	20%	50V	
C417	1-137-360-11	FILM	220PF	5%	50V	(EXCEPT GA30)
C418	1-137-374-11	FILM	0.047uF	5%	50V	(EXCEPT GA30)
C419	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(EXCEPT GA30)
C420	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V	(EXCEPT GA30)
C422	1-124-589-11	ELECT	47uF	20%	16V	(EXCEPT GA30)
C423	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(EXCEPT GA30)
C424	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(EXCEPT GA30)
C425	1-126-157-11	ELECT	10uF	20%	16V	
C426	1-124-259-11	ELECT	4.7uF	20%	16V	
C427	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C428	1-124-259-11	ELECT	4.7uF	20%	16V	
C513	1-126-157-11	ELECT	10uF	20%	16V	
C514	1-126-157-11	ELECT	10uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C515	1-164-346-11	CERAMIC CHIP	1uF		16V	(GA70K/GA77K/GF90K/GF99K)
C516	1-164-346-11	CERAMIC CHIP	1uF		16V	(GA70K/GA77K/GF90K/GF99K)
C517	1-163-036-00	CERAMIC CHIP	0.068uF		50V	(GA70K/GA77K/GF90K/GF99K)
C518	1-163-036-00	CERAMIC CHIP	0.068uF		50V	(GA70K/GA77K/GF90K/GF99K)
C519	1-163-031-11	CERAMIC CHIP	0.01uF		50V	(GA70K/GA77K/GF90K/GF99K)
C520	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(GA70K/GA77K/GF90K/GF99K)
C521	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(GA70K/GA77K/GF90K/GF99K)
C522	1-124-465-00	ELECT	0.47uF	20%	50V	(GA70K/GA77K/GF90K/GF99K)
C523	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C524	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(GA70K/GA77K/GF90K/GF99K)
C525	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C526	1-163-259-91	CERAMIC CHIP	220PF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C527	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V	(GA70K/GA77K/GF90K/GF99K)
C528	1-163-018-00	CERAMIC CHIP	0.0056uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C529	1-124-465-00	ELECT	0.47uF	20%	50V	(GA70K/GA77K/GF90K/GF99K)
C530	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(GA70K/GA77K/GF90K/GF99K)
C531	1-124-589-11	ELECT	47uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C532	1-126-160-11	ELECT	1uF	20%	50V	(GA70K/GA77K/GF90K/GF99K)
C533	1-126-163-11	ELECT	4.7uF	20%	50V	(GA70K/GA77K/GF90K/GF99K)
C535	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V	(GA70K/GA77K/GF90K/GF99K)
C536	1-126-157-11	ELECT	10uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C537	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(GA70K/GA77K/GF90K/GF99K)
C538	1-124-589-11	ELECT	47uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C539	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	(GA70K/GA77K/GF90K/GF99K)
C541	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C542	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C543	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C544	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(GA70K/GA77K/GF90K/GF99K)
C581	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(GA70K/GA77K/GF90K/GF99K)
C582	1-126-157-11	ELECT	10uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C584	1-126-157-11	ELECT	10uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C585	1-126-157-11	ELECT	10uF	20%	16V	(GA70K/GA77K/GF90K/GF99K)
C753	1-163-038-91	CERAMIC CHIP	0.1uF		25V	(GA66/GA77K)
C754	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V	(GA66/GA77K)
C759	1-124-259-11	ELECT	4.7uF	20%	16V	(GA66/GA77K/GF90K/GF99K)
C760	1-124-259-11	ELECT	4.7uF	20%	16V	(GA66/GA77K/GF90K/GF99K)
C761	1-126-160-11	ELECT	1uF	20%	50V	(GF90K/GF99K)
C762	1-126-160-11	ELECT	1uF	20%	50V	(GF90K/GF99K)
C800	1-128-057-11	ELECT	330uF	20%	6.3V	(GA66/GA77K/GF99K)
C801	1-124-589-11	ELECT	47uF	20%	16V	
C802	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C803	1-126-157-11	ELECT	10uF	20%	16V	(EXCEPT GA30/GA50/GA70K/P66)
C804	1-126-157-11	ELECT	10uF	20%	16V	(EXCEPT GA30)
C805	1-128-057-11	ELECT	330uF	20%	6.3V	
C806	1-124-584-00	ELECT	100uF	20%	10V	
C807	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V	(GA77K:PL/GF99K:PL)
C808	1-163-038-00	CERAMIC CHIP	0.1uF		25V	(EXCEPT GA77K:PL/GF99K:PL)

Ref. No.	Part No.	Description			Remarks
C809	1-164-232-11	CERAMIC CHIP	0.01uF		50V
⚠C951	1-104-706-11	FILM	0.22uF	20%	250V
⚠C952	1-113-898-11	CERAMIC	330PF	10%	250V
⚠C953	1-113-898-11	CERAMIC	330PF	10%	250V
⚠C955	1-104-706-11	FILM	0.22uF	20%	250V
⚠C956	1-113-898-11	CERAMIC	330PF	10%	250V
⚠C958	1-107-405-11	ELECT(BLOCK)	68uF	20%	400V
C959	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C960	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C961	1-124-589-11	ELECT	47uF	20%	16V (EXCEPT GA30)
C962	1-163-038-00	CERAMIC CHIP	0.1uF		25V (EXCEPT GA30)
C963	1-126-935-11	ELECT	470uF	20%	16V
C964	1-128-057-11	ELECT	330uF	20%	6.3V
		< CONNECTOR >			
* CN101	1-560-892-00	PIN, CONNECTOR 4P			
CN102	1-691-040-41	HOUSING, CONNECTOR 8P			
CN201	1-691-047-21	HOUSING, CONNECTOR 15P			
CN202	1-784-490-11	CONNECTOR, FFC/FPC 11P (GA66/GA77K/GF80/GF90K/GF99K)			
* CN203	1-766-716-11	CONNECTOR, BOARD TO BOARD 3P			
CN204	1-695-330-31	HOUSING, CONNECTOR 7P			
CN205	1-779-723-11	CONNECTOR, BOARD TO BOARD 9P			
CN206	1-569-930-11	HOUSING, CONNECTOR 13P			
* CN207	1-564-004-11	PIN, CONNECTOR 5P			
* CN208	1-564-005-11	PIN, CONNECTOR 6P			
CN209	1-564-002-11	PIN, CONNECTOR 3P (GA70K/GA77K/GF90K/GF99K)			
* CN210	1-560-890-00	PIN, CONNECTOR 2P			
* CN401	1-560-894-00	PIN, CONNECTOR 6P			
* CN402	1-560-890-00	PIN, CONNECTOR 2P (EXCEPT GA30)			
CN702	1-573-842-11	CONNECTOR, BOARD TO BOARD 10P (GA66/GA77K/GF99K)			
⚠CN951	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
		< JACK >			
CNJ801	1-779-010-21	JACK, PIN 4P (LINE-1 IN/OUT)(EXCEPT GA30)			
* CNJ801	1-779-924-11	JACK, PIN 2P (LINE OUT) (GA30)			
		< DIODE >			
D201	8-719-911-19	DIODE	1SS119		
D203	8-719-048-26	DIODE	GL528V1		
D250	8-719-911-19	DIODE	1SS119 (GF99K)		
D251	8-719-911-19	DIODE	1SS119 (GF90K/GF99K)		
D581	8-719-988-62	DIODE	1SS355 (GA70K/GA77K/GF90K/GF99K)		
D582	8-719-988-62	DIODE	1SS355 (GA70K/GA77K/GF90K/GF99K)		
D807	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF80/GF90K/GF99K)		
D808	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF80/GF90K/GF99K)		
D809	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF80/GF90K/GF99K)		
D810	8-719-108-12	DIODE	RD9.1E-W (GA66/GA77K/GF80/GF90K/GF99K)		
⚠D951	8-719-510-06	DIODE	S1WB60		
D961	8-719-110-18	DIODE	RD10ES-B3 (EXCEPT GA30)		

Ref. No.	Part No.	Description			Remarks
		< FUSE >			
⚠F951	1-532-388-31	FUSE 2A 250V			
		< IC >			
IC101	8-759-562-59	IC	HA118211BF (EXCEPT GA77K:PL/GF99K:PL)		
IC101	8-759-568-04	IC	HA118211BNF(GA77K:PL/GF99K:PL)		
IC201	8-759-562-79	IC	HD6433975RB38F		
IC202	8-759-481-46	IC	LB1943		
IC203	8-759-248-87	IC	MM1256XF-BE		
IC204	8-759-708-05	IC	NJM78L05A		
IC301	8-759-486-64	IC	TDA9615H/N1,557 (GF80/GF90K/GF99K/PH99)		
IC302	8-759-486-92	IC	LA7256 (GF80/GF90K/GF99K/PH99)		
IC502	8-759-344-05	IC	BA7726AFS-E2 (GA70K/GA77K/GF90K/GF99)		
IC503	8-759-344-02	IC	BU9252F-E2 (GA70K/GA77K/GF90K/GF99K)		
IC581	8-759-909-71	IC	BA4558F (GA70K/GA77K/GF90K/GF99K)		
IC751	8-759-525-25	IC	BU4052BCF-E2 (GA66/GA77K/GF90K/GF99K)		
IC752	8-759-909-71	IC	BA4558F (GA66/GA77K)		
		< JUMPER RESISTOR >			
JR001	1-216-295-00	METAL CHIP	0	5%	1/10W
JR002	1-216-295-00	METAL CHIP	0	5%	1/10W
JR003	1-216-296-00	METAL CHIP	0	5%	1/8W
JR004	1-216-296-00	METAL CHIP	0	5%	1/8W
JR005	1-216-296-00	METAL CHIP	0	5%	1/8W
JR006	1-216-296-00	METAL CHIP	0	5%	1/8W
JR007	1-216-295-00	METAL CHIP	0	5%	1/10W
JR008	1-216-296-00	METAL CHIP	0	5%	1/8W
JR009	1-216-296-00	METAL CHIP	0	5%	1/8W
JR010	1-216-296-00	METAL CHIP	0	5%	1/8W
JR011	1-216-295-00	METAL CHIP	0	5%	1/10W
JR012	1-216-296-00	METAL CHIP	0	5%	1/8W
JR013	1-216-295-00	METAL CHIP	0	5%	1/10W
JR014	1-216-296-00	METAL CHIP	0	5%	1/8W
JR015	1-216-296-00	METAL CHIP	0	5%	1/8W
JR016	1-216-296-00	METAL CHIP	0	5%	1/8W
JR017	1-216-296-00	METAL CHIP	0	5%	1/8W
JR018	1-216-295-00	METAL CHIP	0	5%	1/10W
JR019	1-216-296-00	METAL CHIP	0	5%	1/8W
JR020	1-216-295-00	METAL CHIP	0	5%	1/10W
JR021	1-216-296-00	METAL CHIP	0	5%	1/8W
JR022	1-216-296-00	METAL CHIP	0	5%	1/8W
JR023	1-216-295-00	METAL CHIP	0	5%	1/10W
JR024	1-216-295-00	METAL CHIP	0	5%	1/10W
JR025	1-216-295-00	METAL CHIP	0	5%	1/10W
JR026	1-216-295-00	METAL CHIP	0	5%	1/10W
JR027	1-216-296-00	METAL CHIP	0	5%	1/8W
JR028	1-216-295-00	METAL CHIP	0	5%	1/10W
JR029	1-216-296-00	METAL CHIP	0	5%	1/8W
JR030	1-216-295-00	METAL CHIP	0	5%	1/10W
JR031	1-216-296-00	METAL CHIP	0	5%	1/8W
JR032	1-216-296-00	METAL CHIP	0	5%	1/8W
JR033	1-216-296-00	METAL CHIP	0	5%	1/8W
JR034	1-216-296-00	METAL CHIP	0	5%	1/8W
JR035	1-216-296-00	METAL CHIP	0	5%	1/8W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
JR036	1-216-295-00	METAL CHIP	0	5%	1/10W
JR037	1-216-296-00	METAL CHIP	0	5%	1/8W
JR038	1-216-296-00	METAL CHIP	0	5%	1/8W
JR039	1-216-296-00	METAL CHIP	0	5%	1/8W
JR040	1-216-296-00	METAL CHIP	0	5%	1/8W
JR041	1-216-296-00	METAL CHIP	0	5%	1/8W
JR042	1-216-295-00	METAL CHIP	0	5%	1/10W
JR043	1-216-296-00	METAL CHIP	0	5%	1/8W
JR044	1-216-296-00	METAL CHIP	0	5%	1/8W
JR045	1-216-296-00	METAL CHIP	0	5%	1/8W
JR046	1-216-296-00	METAL CHIP	0	5%	1/8W
JR047	1-216-296-00	METAL CHIP	0	5%	1/8W
JR048	1-216-295-00	METAL CHIP	0	5%	1/10W
JR049	1-216-296-00	METAL CHIP	0	5%	1/8W
JR050	1-216-296-00	METAL CHIP	0	5%	1/8W
JR051	1-216-296-00	METAL CHIP	0	5%	1/8W
JR052	1-216-296-00	METAL CHIP	0	5%	1/8W
JR053	1-216-296-00	METAL CHIP	0	5%	1/8W
JR054	1-216-296-00	METAL CHIP	0	5%	1/8W
JR055	1-216-295-00	METAL CHIP	0	5%	1/10W
JR056	1-216-295-00	METAL CHIP	0	5%	1/10W
JR057	1-216-296-00	METAL CHIP	0	5%	1/8W
JR058	1-216-295-00	METAL CHIP	0	5%	1/10W
JR059	1-216-296-00	METAL CHIP	0	5%	1/8W
JR060	1-216-296-00	METAL CHIP	0	5%	1/8W
JR061	1-216-296-00	METAL CHIP	0	5%	1/8W
JR062	1-216-296-00	METAL CHIP	0	5%	1/8W
JR063	1-216-295-00	METAL CHIP	0	5%	1/10W
JR064	1-216-296-00	METAL CHIP	0	5%	1/8W
JR065	1-216-296-00	METAL CHIP	0	5%	1/8W
JR066	1-216-296-00	METAL CHIP	0	5%	1/8W
JR067	1-216-295-00	METAL CHIP	0	5%	1/10W
JR068	1-216-296-00	METAL CHIP	0	5%	1/8W
JR069	1-216-295-00	METAL CHIP	0	5%	1/10W
JR070	1-216-295-00	METAL CHIP	0	5%	1/10W
JR071	1-216-295-00	METAL CHIP	0	5%	1/10W
JR078	1-216-295-00	METAL CHIP	0	5%	1/10W
JR079	1-216-295-00	METAL CHIP	0	5%	1/10W
JR080	1-216-295-00	METAL CHIP	0	5%	1/10W
JR081	1-216-295-00	METAL CHIP	0	5%	1/10W
JR082	1-216-296-00	METAL CHIP	0	5%	1/8W
		< JUMPER RESISTOR >			
JS302	1-216-295-00	METAL CHIP	0	5%	1/10W
JS401	1-216-295-00	METAL CHIP	0	5%	1/10W (GA30)
JS502	1-216-295-00	METAL CHIP	0	5%	1/10W (GF90K)
JS907	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GF90K)
JS911	1-216-295-00	METAL CHIP	0	5%	1/10W (EXCEPT GA77K:PL/GF99K:PL)
JS922	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GA77K)
JS924	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GA77K)
JS927	1-216-295-00	METAL CHIP	0	5%	1/10W (EXCEPT GA30:PS,TK/GA50:ME,SG/GF90K/GF99L)
JS928	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GA77K/GF80/PH99)
JS929	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GA77K)
JS930	1-216-295-00	METAL CHIP	0	5%	1/10W (GA66/GA77K)
		< JUMPER RESISTOR >			
JW223	1-249-429-11	CARBON	10K	5%	1/4W (EXCEPT GA77K:PL/GF99K:PL)
		< COIL >			
L101	1-414-189-31	INDUCTOR	100uH		
L102	1-414-189-31	INDUCTOR	100uH		
L104	1-410-510-11	INDUCTOR	12uH		
L105	1-414-189-31	INDUCTOR	100uH		
L106	1-414-189-31	INDUCTOR	100uH		
L107	1-410-520-11	INDUCTOR	82uH (EXCEPT GA77K:PL/GF99K:PL)		
L108	1-410-520-11	INDUCTOR	82uH		
L109	1-414-189-31	INDUCTOR	100uH		
L110	1-410-509-11	INDUCTOR	10uH		
L201	1-410-511-11	INDUCTOR	15uH		
L206	1-410-503-11	INDUCTOR	3.3uH		
L207	1-414-189-31	INDUCTOR	100uH		
L208	1-410-513-11	INDUCTOR	22uH (EXCEPT GA77K:PL/GF99K:PL)		
L301	1-414-189-31	INDUCTOR	100uH (GF80/GF90K/GF99K/PH99)		
L302	1-414-189-31	INDUCTOR	100uH (GF80/GF90K/GF99K/PH99)		
L401	1-414-189-31	INDUCTOR	100uH (EXCEPT GA30)		
L501	1-414-189-31	INDUCTOR	100uH (GA70K/GA77K/GF90K/GF99K)		
L801	1-414-189-31	INDUCTOR	100uH		
L802	1-414-189-31	INDUCTOR	100uH		
L952	1-403-588-11	INDUCTOR	22uH		
L953	1-403-588-11	INDUCTOR	22uH		
		< LINE FILTER >			
⚠LF951	1-423-850-11	FILTER, LINE			
		< PHOTO INTERRUPTER >			
PH201	8-749-013-23	PHOTO INTERRUPTER GP3S120			
PH202	8-749-013-23	PHOTO INTERRUPTER GP3S120			
		< IC LINK >			
⚠PS001	1-533-586-31	LINK, IC 0.315A			
⚠PS002	1-533-589-31	LINK, IC 0.75A			
		< TRANSISTOR >			
Q101	8-729-421-19	TRANSISTOR	UN2213 (EXCEPT GA77K:PL/GF99K:PL)		
Q102	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q103	8-729-421-19	TRANSISTOR	UN2213		
Q104	8-729-421-19	TRANSISTOR	UN2213 (EXCEPT GA77K:PL/GF99K:PL)		
Q201	8-729-042-88	TRANSISTOR	RPT-37PBT32		
Q202	8-729-042-88	TRANSISTOR	RPT-37PBT32		
Q203	8-729-281-53	TRANSISTOR	2SC1815-GR		
Q204	8-729-421-19	TRANSISTOR	UN2213 (EXCEPT GA77K:PL/GF99K:PL)		
Q205	8-729-010-29	TRANSISTOR	MSD601-RST1		
Q206	8-729-421-19	TRANSISTOR	UN2213 (GA66/GA77K/GF99K)		

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description		Remarks
Q207	8-729-421-19	TRANSISTOR	UN2213	
Q208	8-729-421-19	TRANSISTOR	UN2213	
Q209	8-729-421-19	TRANSISTOR	UN2213	
Q210	8-729-421-19	TRANSISTOR	UN2213 (EXCEPT GA30)	
Q211	8-729-421-19	TRANSISTOR	UN2213	
			(GF80/GF90K/GF99K/PH99)	
Q212	8-729-421-19	TRANSISTOR	UN2213	
			(GF80/GF90K/GF99K/PH99)	
Q213	8-729-421-19	TRANSISTOR	UN2213	
			(GF80/GF90K/GF99K/PH99)	
Q214	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q215	8-729-010-05	TRANSISTOR	MSB709-RT1	
Q216	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q217	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q218	8-729-421-19	TRANSISTOR	UN2213	
Q219	8-729-421-19	TRANSISTOR	UN2213	
Q220	8-729-421-19	TRANSISTOR	UN2213	
			(EXCEPT GA77K:PL/GF99K:PL)	
Q221	8-729-421-19	TRANSISTOR	UN2213	
			(GA66/GA77K/GF99K)	
Q222	8-729-421-19	TRANSISTOR	UN2213	
			(GA66/GA77K/GF99K)	
Q223	8-729-421-19	TRANSISTOR	UN2213	
			(GA77K:PL/GF99K:PL)	
Q224	8-729-421-19	TRANSISTOR	UN2213	
			(EXCEPT GA77K:PL/GF99K:PL)	
Q225	8-729-421-19	TRANSISTOR	UN2213	
			(EXCEPT GA77K:PL/GF99K:PL)	
Q226	8-729-421-19	TRANSISTOR	UN2213	
			(GA66/GA77K/GF99K)	
Q250	8-729-421-19	TRANSISTOR	UN2213(GF90K/GF99K)	
Q251	8-729-421-19	TRANSISTOR	UN2213(GF90K/GF99K)	
Q401	8-729-010-29	TRANSISTOR	MSD601-RST1	
			(EXCEPT GA30)	
Q402	8-729-010-29	TRANSISTOR	MSD601-RST1	
			(EXCEPT GA30)	
Q403	8-729-901-06	TRANSISTOR	DTA144EK (EXCEPT GA30)	
Q404	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q	
			(EXCEPT GA30)	
Q405	8-729-901-06	TRANSISTOR	DTA144EK (EXCEPT GA30)	
Q406	8-729-421-19	TRANSISTOR	UN2213 (EXCEPT GA30)	
Q407	8-729-010-29	TRANSISTOR	MSD601-RST1	
Q410	8-729-010-29	TRANSISTOR	MSD601-RST1	
			(GA70K/GA77K/GF90K/GF99K)	
Q502	8-729-010-29	TRANSISTOR	MSD601-RST1	
			(GA70K/GA77K/GF90K/GF99K)	
Q581	8-729-421-19	TRANSISTOR	UN2213	
			(GA70K/GA77K/GF90K/GF99K)	
Q751	8-729-421-19	TRANSISTOR	UN2213(GA66/GA77K)	
Q752	8-729-421-19	TRANSISTOR	UN2213	
			(GA66/GA77K/GF90K/GF99K)	
Q753	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
			(GA66/GA77K)	
Q801	8-729-026-49	TRANSISTOR	2SA1037AK-T146-R	
⚠Q961	8-729-012-31	TRANSISTOR	2SC4040-TL2-Q	
			(EXCEPT GA30)	

< RESISTOR >

R101	1-216-041-00	METAL CHIP	470	5%	1/10W
R102	1-216-083-00	METAL CHIP	27K	5%	1/10W
R103	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R104	1-216-127-11	METAL CHIP	1.8M	5%	1/10W
R105	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R107	1-216-295-00	METAL CHIP	0	5%	1/10W
			(EXCEPT GA77K:PL/GF99K:PL)		
R108	1-216-049-00	METAL CHIP	1K	5%	1/10W
R109	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R111	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R150	1-216-073-00	METAL CHIP	10K	5%	1/10W
R200	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
			(EXCEPT GA77K:PL/GF99K:PL)		
R201	1-216-121-91	RES,CHIP	1M	5%	1/10W
R202	1-216-262-00	RES,CHIP	470K	5%	1/8W
R203	1-216-049-00	METAL CHIP	1K	5%	1/10W
R204	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R205	1-216-049-00	METAL CHIP	1K	5%	1/10W
R206	1-216-081-00	METAL CHIP	22K	5%	1/10W
R207	1-216-025-91	RES,CHIP	100	5%	1/10W
R208	1-216-099-00	METAL CHIP	120K	5%	1/10W
R209	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R210	1-216-081-00	METAL CHIP	22K	5%	1/10W
R211	1-216-049-00	METAL CHIP	1K	5%	1/10W
R212	1-216-049-00	METAL CHIP	1K	5%	1/10W
R213	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R214	1-216-049-00	METAL CHIP	1K	5%	1/10W
R215	1-216-105-91	RES,CHIP	220K	5%	1/10W
R216	1-216-073-00	METAL CHIP	10K	5%	1/10W
R217	1-216-230-00	RES,CHIP	22K	5%	1/8W
R218	1-216-073-00	METAL CHIP	10K	5%	1/10W
R219	1-216-059-00	METAL CHIP	2.7K	5%	1/10W
			(GA30/GA50/GF80/P66/PH99)		
R219	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
					(GA70K/GF90K)
R219	1-216-077-00	METAL CHIP	15K	5%	1/10W
					(GA66)
R219	1-216-689-11	METAL CHIP	39K	0.5%	1/10W
					(GA77K/GF99K)
R220	1-216-073-00	METAL CHIP	10K	5%	1/10W
R221	1-216-222-00	RES,CHIP	10K	5%	1/8W
R222	1-216-073-00	METAL CHIP	10K	5%	1/10W
R223	1-216-073-00	METAL CHIP	10K	5%	1/10W
R224	1-249-429-11	CARBON	10K	5%	1/4W
R225	1-216-073-00	METAL CHIP	10K	5%	1/10W
R226	1-216-089-00	METAL CHIP	47K	5%	1/10W
R227	1-216-077-00	METAL CHIP	15K	5%	1/10W
R228	1-216-049-00	METAL CHIP	1K	5%	1/10W
R229	1-216-295-00	METAL CHIP	0	5%	1/10W
R230	1-216-295-00	METAL CHIP	0	5%	1/10W
R231	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R232	1-216-073-00	METAL CHIP	10K	5%	1/10W
R233	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R234	1-216-037-00	METAL CHIP	330	5%	1/10W
R235	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R236	1-216-073-00	METAL CHIP	10K	5%	1/10W
R237	1-216-073-00	METAL CHIP	10K	5%	1/10W
R238	1-216-121-91	RES,CHIP	1M	5%	1/10W
R239	1-216-073-00	METAL CHIP	10K	5%	1/10W
			(EXCEPT GA77K:PL/GF99K:PL)		
R240	1-249-435-11	CARBON	33K	5%	1/4W
R241	1-216-049-00	METAL CHIP	1K	5%	1/10W

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MA-336

Ref. No.	Part No.	Description				Remarks
R242	1-216-085-00	METAL CHIP	33K	5%	1/10W	
R243	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R244	1-216-238-91	RES,CHIP	47K	5%	1/8W	
R245	1-249-437-11	CARBON	47K	5%	1/4W	
R246	1-247-807-31	CARBON	100	5%	1/4W	
R247	1-216-033-00	METAL CHIP	220	5%	1/10W	
R248	1-247-807-31	CARBON	100	5%	1/4W	
R249	1-216-182-00	RES,CHIP	220	5%	1/8W	
R250	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA66/GA77K/GF99K)
R252	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R253	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R254	1-216-049-00	METAL CHIP	1K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R255	1-216-049-00	METAL CHIP	1K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R256	1-216-053-00	METAL CHIP	1.5K	5%	1/10W	(GA50/P66)
R256	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	(GA66/GA70K/GA77K)
R256	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA30/GF80/GF90K/GF99K/PH99)
R257	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R257	1-216-069-00	METAL CHIP	6.8K	5%	1/10W	(GA50/GA66/GA70K/GA77K)
R257	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	(P66)
R258	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R259	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R260	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R261	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R262	1-216-021-00	METAL CHIP	68	5%	1/10W	
R263	1-216-021-00	METAL CHIP	68	5%	1/10W	
R264	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R265	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R266	1-216-037-00	METAL CHIP	330	5%	1/10W	
R267	1-216-019-00	METAL CHIP	56	5%	1/10W	
R268	1-216-071-00	METAL CHIP	8.2K	5%	1/10W	
R269	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R270	1-216-121-91	RES,CHIP	1M	5%	1/10W	
R271	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R272	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R273	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R274	1-247-863-91	CARBON	22K	5%	1/4W	(GF80/GF90K/GF99K/PH99)
R275	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R276	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R277	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R279	1-249-403-11	CARBON	68	5%	1/4W F	
R280	1-216-021-00	METAL CHIP	68	5%	1/10W	
R281	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R282	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R283	1-249-429-11	CARBON	10K	5%	1/4W	(EXCEPT GA77K:PL/GF99K:PL)
R284	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(EXCEPT GA77K:PL/GF99K:PL)
R285	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA66/GA77K/GF99K)
R290	1-216-037-00	METAL CHIP	330	5%	1/10W	
R291	1-216-037-00	METAL CHIP	330	5%	1/10W	
R296	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GF90K/GF99K)
R297	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GF90K/GF99K)
R298	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R299	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R300	1-216-081-00	METAL CHIP	22K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R301	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R302	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R303	1-216-033-00	METAL CHIP	220	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R304	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R305	1-216-083-00	METAL CHIP	27K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R309	1-216-091-00	METAL CHIP	56K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R310	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R311	1-216-041-00	METAL CHIP	470	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R312	1-216-041-00	METAL CHIP	470	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R313	1-216-041-00	METAL CHIP	470	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R314	1-216-041-00	METAL CHIP	470	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R315	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(GF80/GF90K/GF99K/PH99)
R316	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R317	1-216-091-00	METAL CHIP	56K	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R318	1-216-133-00	METAL CHIP	3.3M	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R340	1-216-033-00	METAL CHIP	220	5%	1/10W	(GF80/GF90K/GF99K/PH99)
R400	1-216-103-00	METAL CHIP	180K	5%	1/10W	
R401	1-216-025-91	RES,CHIP	100	5%	1/10W	
R402	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R403	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R404	1-216-232-00	RES,CHIP	27K	5%	1/8W	
R405	1-216-077-00	METAL CHIP	15K	5%	1/10W	(EXCEPT GA30)
R406	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(EXCEPT GA30)
R407	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R408	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R409	1-216-125-00	METAL CHIP	1.5M	5%	1/10W	

Ref. No.	Part No.	Description				Remarks
R410	1-216-073-00	METAL CHIP	10K	5%	1/10W	(EXCEPT GA30)
R411	1-216-073-00	METAL CHIP	10K	5%	1/10W	(EXCEPT GA30)
R412	1-249-432-11	CARBON	18K	5%	1/4W	(EXCEPT GA30)
R413	1-216-083-00	METAL CHIP	27K	5%	1/10W	(EXCEPT GA30)
R414	1-249-393-11	CARBON	10	5%	1/4W F	(EXCEPT GA30)
R415	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R416	1-216-049-00	METAL CHIP	1K	5%	1/10W	
R417	1-216-041-00	METAL CHIP	470	5%	1/10W	
R418	1-216-073-00	METAL CHIP	10K	5%	1/10W	
R420	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	(GA77K:PL/GF99K:PL)
R420	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(EXCEPT GA77K:PL/GF99K:PL)
R421	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	(EXCEPT GA30)
R422	1-216-295-00	METAL CHIP	0	5%	1/10W	(EXCEPT GA30)
R508	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R509	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R510	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R511	1-216-079-00	METAL CHIP	18K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R512	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R513	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R514	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R515	1-216-081-00	METAL CHIP	22K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R516	1-216-081-00	METAL CHIP	22K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R517	1-216-129-00	METAL CHIP	2.2M	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R518	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R519	1-216-077-00	METAL CHIP	15K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R523	1-216-081-00	METAL CHIP	22K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R553	1-216-077-00	METAL CHIP	15K	5%	1/10W	(GA70K/GA77K/GF99K)
R553	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(GF90K)
R555	1-216-077-00	METAL CHIP	15K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R556	1-216-077-00	METAL CHIP	15K	5%	1/10W	(GA70K/GA77K/GF99K)
R556	1-216-689-11	METAL CHIP	39K	0.5%	1/10W	(GF90K)
R557	1-216-077-00	METAL CHIP	15K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R558	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R559	1-216-049-00	METAL CHIP	1K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R560	1-216-037-00	METAL CHIP	330	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R561	1-216-037-00	METAL CHIP	330	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R562	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R563	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R565	1-216-081-00	METAL CHIP	22K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R570	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R581	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R582	1-216-049-00	METAL CHIP	1K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R583	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R584	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R585	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R586	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA70K/GA77K/GF90K/GF99K)
R751	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K)
R752	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K)
R753	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA66/GA77K)
R754	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R755	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K)
R756	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K)
R757	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA66/GA77K)
R758	1-216-089-00	METAL CHIP	47K	5%	1/10W	(GA66/GA77K)
R759	1-216-073-00	METAL CHIP	10K	5%	1/10W	(GA66/GA77K)
R760	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R761	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R762	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R763	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R764	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R765	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R766	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R767	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R768	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)
R769	1-216-097-91	RES,CHIP	100K	5%	1/10W	(GA66/GA77K/GF90K/GF99K)

Ref. No.	Part No.	Description			Remarks
R770	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GF90K/GF99K)
R771	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GF90K/GF99K)
R800	1-216-021-00	METAL CHIP	68	5% 1/10W	(GA66/GA77K/GF99K)
R801	1-249-412-11	CARBON	390	5% 1/4W F	
R802	1-216-190-00	RES,CHIP	470	5% 1/8W	(EXCEPT GA30)
R803	1-216-051-00	METAL CHIP	1.2K	5% 1/10W	(EXCEPT GA77K:PL/GF99K:PL)
R803	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	(GA77K:PL/GF99K:PL)
R804	1-249-403-11	CARBON	68	5% 1/4W F	
R805	1-216-190-00	RES,CHIP	470	5% 1/8W	
R806	1-216-023-00	METAL CHIP	82	5% 1/10W	(EXCEPT GA30)
R807	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R808	1-216-021-00	METAL CHIP	68	5% 1/10W	(GF80/GF90K/GF99K/PH99)
R808	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	(GA50/GA66/GA70K/GA77K)
R808	1-216-071-00	METAL CHIP	8.2K	5% 1/10W	(P66)
R809	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GF80/GF90K/GF99K/PH99)
R810	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GF80/GF90K/GF99K/PH99)
⚠R952	1-214-947-00	METAL	2.7M	1% 1/2W	
R961	1-247-807-31	CARBON	100	5% 1/4W	(EXCEPT GA30)
		< MODULATOR >			
RFU801	1-473-226-11	MODULATOR, RF (RFU-2043)			(EXCEPT GA77K:PL/GF99K:PL)
RFU801	1-473-240-11	MODULATOR, RF (RFU-1048)			(GA77K:PL/GF99K:PL)
		< VARIABLE RESISTOR >			
RV201	1-223-239-11	RES, ADJ, CARBON 10K(AF SWP)			(GF80/GF90K/GF99K/PH99)
RV202	1-223-239-11	RES, ADJ, CARBON 10K(V SWP)			
		< SWITCH >			
S201	1-771-155-11	SWITCH, ROTARY(MECHANISM MODE)			
S202	1-762-108-11	SWITCH, PUSH (1 KEY)(REC PROOF)			
S203	1-771-574-21	SWITCH, TACTILE (REC) (EXCEPT GA30)			
S204	1-771-574-21	SWITCH, TACTILE (PAUSE)			
S801	1-571-588-21	SWITCH, SLIDE (TV SYSTEM) (EXCEPT GA30)			
		< TRANSFORMER >			
T401	1-431-554-11	TRANSFORMER, BIAS OSCILLATION			(EXCEPT GA30)
T401	1-433-494-11	BIAS OSCILLATION TRANSFORMER			(EXCEPT GA30)
⚠T951	1-468-248-12	POWER BLOCK			
		< VIBRATOR >			
X101	1-760-708-11	VIBRATOR, CRYSTAL 4.433619MHz			(EXCEPT GA77K:PL/GF99K:PL)
* X102	1-760-709-11	VIBRATOR, CRYSTAL 3.579545MHz			(EXCEPT GA30)
X201	1-767-855-11	VIBRATOR, CRYSTAL 10MHz			
X501	1-567-178-00	OSCILLATOR, CERAMIC 455kHz			(GA40K/GA70K/GA77K/GF90K/GF99K)

Ref. No.	Part No.	Description			Remarks
		< VARISTOR >			
Z951	1-801-267-31	VARISTOR TNR10V431K660			
*	A-6794-584-A	MJ-91BOARD, COMPLETE			
		**********			
		(GA70K:PS/GA77K:PS,PL/GF90K:PS/GF99K:ME,PS,PL)			
*	A-6794-605-A	MJ-91BOARD, COMPLETE			
		**********			
		(GA70K:TK/GA77K:TK/GF90K:TK/GF99K:TK)			
		(Ref.No.:2,000 Series)			
		< CAPACITOR >			
C501	1-124-234-00	ELECT	22uF	20% 16V	
C502	1-164-159-21	CERAMIC	0.1uF	50V	
C503	1-164-159-21	CERAMIC	0.1uF	50V	
C504	1-163-259-91	CERAMIC CHIP	220PF	5% 50V	
C507	1-164-159-21	CERAMIC	0.1uF	50V	
C508	1-163-259-91	CERAMIC CHIP	220PF	5% 50V	
C510	1-164-159-21	CERAMIC	0.1uF	50V	
C511	1-164-159-21	CERAMIC	0.1uF	50V	
C545	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	
C546	1-163-121-00	CERAMIC CHIP	150PF	5% 50V	
C550	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
		< CONNECTOR >			
CN501	1-506-469-11	PIN, CONNECTOR 4P			
CN502	1-564-002-11	PIN, CONNECTOR 3P			
		< DIODE >			
D504	8-719-988-62	DIODE 1SS355			
		< IC >			
IC501	8-759-344-04	IC BA7760F-E2			
		< JACK >			
MCJ501	1-750-781-11	JACK, LARGE TYPE (MIC IN 1)			
MCJ502	1-750-781-11	JACK, LARGE TYPE (MIC IN 2)			
		< RESISTOR >			
R501	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R502	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R503	1-216-097-91	RES,CHIP	100K	5% 1/10W	
R504	1-216-097-91	RES,CHIP	100K	5% 1/10W	
R505	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R506	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R507	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R550	1-216-689-11	METAL CHIP	39K	0.5% 1/10W	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description			Remarks
*	A-6794-586-A	SR-35BOARD, COMPLETE			
		**********			
					(GA77K:PS,PL/GF99K:PS)
*	A-6794-600-A	SR-35BOARD, COMPLETE (GA66)			
		**********			
*	A-6794-607-A	SR-35BOARD, COMPLETE			
		**********			
					(GA77K:TK/GF99K:TK)
					(Ref.No.:2,000 Series)
		< CAPACITOR >			
C701	1-126-157-11	ELECT	10uF	20% 16V	(GA77K/GF99K)
C702	1-126-157-11	ELECT	10uF	20% 16V	(GA77K/GF99K)
C703	1-124-234-00	ELECT	22uF	20% 16V	(GA77K/GF99K)
C704	1-164-489-11	CERAMIC CHIP	0.22uF	10% 16V	(GA77K/GF99K)
C705	1-163-809-11	CERAMIC CHIP	0.047uF	10% 25V	(GA77K/GF99K)
C706	1-126-157-11	ELECT	10uF	20% 16V	(GA77K/GF99K)
C707	1-126-157-11	ELECT	10uF	20% 16V	(GA77K/GF99K)
C708	1-126-157-11	ELECT	10uF	20% 16V	
C709	1-126-157-11	ELECT	10uF	20% 16V	
C710	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C711	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C712	1-163-037-11	CERAMIC CHIP	0.022uF	10% 25V	
C713	1-163-037-11	CERAMIC CHIP	0.022uF	10% 25V	
C714	1-126-157-11	ELECT	10uF	20% 16V	
C715	1-126-157-11	ELECT	10uF	20% 16V	
C716	1-126-157-11	ELECT	10uF	20% 16V	
C717	1-164-161-11	CERAMIC CHIP	0.0022uF	10% 100V	
C718	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C719	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C720	1-126-157-11	ELECT	10uF	20% 16V	
C721	1-126-157-11	ELECT	10uF	20% 16V	
C722	1-126-157-11	ELECT	10uF	20% 16V	
C723	1-126-157-11	ELECT	10uF	20% 16V	
C724	1-126-157-11	ELECT	10uF	20% 16V	
C725	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C726	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C727	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C728	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C729	1-126-157-11	ELECT	10uF	20% 16V	
C730	1-126-157-11	ELECT	10uF	20% 16V	
C731	1-126-157-11	ELECT	10uF	20% 16V	
C732	1-126-157-11	ELECT	10uF	20% 16V	
C733	1-126-157-11	ELECT	10uF	20% 16V	
C734	1-126-157-11	ELECT	10uF	20% 16V	
		< CONNECTOR >			
CN701	1-573-824-11	CONNECTOR, BOARD TO BOARD 10P			
		< IC >			
IC701	8-759-484-63	IC	BA3838F-E2 (GA77K/GF99K)		
IC702	8-752-068-78	IC	CXA1842S		
IC703	8-759-480-28	IC	MM1354BD		

Ref. No.	Part No.	Description			Remarks
		< JUMPER RESISTOR >			
JR701	1-216-296-00	METAL CHIP	0	5% 1/8W	
JR703	1-216-296-00	METAL CHIP	0	5% 1/8W	
		< JUMPER RESISTOR >			
JS701	1-216-295-00	METAL CHIP	0	5% 1/10W	(GA66)
JS702	1-216-295-00	METAL CHIP	0	5% 1/10W	(GA66)
		< COIL >			
L701	1-410-516-11	INDUCTOR	39uH		
		< TRANSISTOR >			
Q701	8-729-424-67	TRANSISTOR	UN2216		
Q702	8-729-424-67	TRANSISTOR	UN2216		
Q703	8-729-900-51	TRANSISTOR	DTA114TK		
Q704	8-729-424-67	TRANSISTOR	UN2216		
Q705	8-729-424-67	TRANSISTOR	UN2216		
		< RESISTOR >			
R701	1-216-089-00	METAL CHIP	47K	5% 1/10W	(GA77K/GF99K)
R702	1-216-089-00	METAL CHIP	47K	5% 1/10W	(GA77K/GF99K)
R703	1-216-089-00	METAL CHIP	47K	5% 1/10W	(GA77K/GF99K)
R704	1-216-081-00	METAL CHIP	22K	5% 1/10W	(GA77K/GF99K)
R705	1-216-063-91	RES,CHIP	3.9K	5% 1/10W	(GA77K/GF99K)
R706	1-216-081-00	METAL CHIP	22K	5% 1/10W	(GA77K/GF99K)
R707	1-216-063-91	RES,CHIP	3.9K	5% 1/10W	(GA77K/GF99K)
R708	1-216-089-00	METAL CHIP	47K	5% 1/10W	
R709	1-216-049-00	METAL CHIP	1K	5% 1/10W	(GA66)
R709	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(GA77K/GF99K)
R710	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	(GA66)
R710	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	(GA77K/GF99K)
R711	1-216-049-00	METAL CHIP	1K	5% 1/10W	(GA66)
R711	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(GA77K/GF99K)
R712	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R713	1-216-077-00	METAL CHIP	15K	5% 1/10W	
R714	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R715	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R716	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R717	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R718	1-216-049-00	METAL CHIP	1K	5% 1/10W	
R719	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R720	1-216-078-00	RES,CHIP	16K	5% 1/10W	
R721	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	
R722	1-216-077-00	METAL CHIP	15K	5% 1/10W	

Ref. No.	Part No.	Description			Remarks
R723	1-216-081-00	METAL CHIP	22K	5% 1/10W	
R724	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R725	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R726	1-216-097-91	RES,CHIP	100K	5% 1/10W	
R727	1-216-097-91	RES,CHIP	100K	5% 1/10W	
R728	1-216-037-00	METAL CHIP	330	5% 1/10W	
R729	1-216-037-00	METAL CHIP	330	5% 1/10W	
R730	1-216-049-00	METAL CHIP	1K	5% 1/10W	(GA66)
R730	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(GA77K/GF99K)
R731	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	(GA66)
R731	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	(GA77K/GF99K)
R732	1-216-049-00	METAL CHIP	1K	5% 1/10W	(GA66)
R732	1-216-061-00	METAL CHIP	3.3K	5% 1/10W	(GA77K/GF99K)
R733	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	(GA66)
R733	1-216-069-00	METAL CHIP	6.8K	5% 1/10W	(GA77K/GF99K)
R735	1-216-073-00	METAL CHIP	10K	5% 1/10W	
R736	1-216-075-00	METAL CHIP	12K	5% 1/10W	
R737	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GA66)
R737	1-216-105-91	RES,CHIP	220K	5% 1/10W	(GA77K/GF99K)
R738	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GA66)
R738	1-216-105-91	RES,CHIP	220K	5% 1/10W	(GA77K/GF99K)
R739	1-216-097-91	RES,CHIP	100K	5% 1/10W	(GA66)
R739	1-216-105-91	RES,CHIP	220K	5% 1/10W	(GA77K/GF99K)
R740	1-216-057-00	METAL CHIP	2.2K	5% 1/10W	(GA66)
R740	1-216-105-91	RES,CHIP	220K	5% 1/10W	(GA77K/GF99K)

MISCELLANEOUS
****

⚠12	1-777-851-41	CORD, POWER	
21	1-790-118-11	CABLE, FLAT (FJK-1)	(GA66/GA70K/GA77K/GF80/GF90K/GF99K/PH99)
22	1-790-119-11	CABLE, FLAT (FFR-6)	
23	1-790-120-11	CABLE, FLAT (FFR-7)	
56	1-790-117-11	CABLE, FLAT (FDM-5)	
704	1-500-144-11	HEAD, FE	
721	A-6759-620-A	HEAD BLOCK ASSY, ACE (TDK)	
776	1-759-183-11	DRUM ASSY, DZH-78A-R	(GA30:PS,TK/GA50:PS,TK/GA70K:PS,TK/GA77K:PS,TK/P66)
776	1-759-449-11	DRUM ASSY, DZH-91A-R	(GF80:PS,TK/GF90K:PS,TK/GF99K:ME,PS,TK/PH99)
776	1-759-451-11	DRUM ASSY, DZH-90A-R(GF99K:PL)	
776	1-759-453-11	DRUM ASSY, DZH-89A-R	(GA30:SG,ME/GA50:SG,ME/GA66:ME)
776	1-759-455-11	DRUM ASSY, DZH-71D-R(GA77K:PL)	
M902	1-698-971-11	MOTOR, DC(CAPSTAN)	
M903	X-3947-577-1	MOTOR ASSY, CAM	

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-542-273-11	MICROPHONE (F-VJ5301)	(GA70K,GA77K,GF90K,GF99K)
	1-569-008-21	ADAPTOR, CONVERSION 2P	(GA30:ME/GA66/GF99K)
	1-575-334-11	CORD,CONNECTION (FOR AUDIO/VIDEO)	(GA66/GA77K/GF80/GF90/GF99K)
	1-696-592-11	CORD,CONNECTION (NTSC)(FOR RF)	(GA77K:PL/GF99K:PL)
	1-696-593-11	CORD,CONNECTION (PAL)(FOR RF)	(EXCEPT GA77K:PL/GF99K:PL)
*	3-052-159-02	INDIVIDUAL CARTON(GF80:EE)	
	3-864-834-11	MANUAL, INSTRUCTION(ENGLISH)	(GF90K/GF99K: ME ,PS)
	3-864-834-21	MANUAL, INSTRUCTION(ARABIC)(GF99K: ME)	
	3-864-835-11	MANUAL, INSTRUCTION(ENGLISH)(GF80: PS)	
	3-864-836-11	MANUAL, INSTRUCTION(ENGLISH)	(GA66/GA70K:PS/GA77K: PS)
	3-864-836-21	MANUAL, INSTRUCTION(ARABIC)(GA66)	
	3-864-837-11	MANUAL, INSTRUCTION(ENGLISH)	(GA30: ME, PS, SG/GA50: ME, PS, SG)
	3-864-837-21	MANUAL, INSTRUCTION(ARABIC)	(GA30: ME, SG/GA50: ME, SG)
	3-864-837-31	MANUAL, INSTRUCTION(PERSIAN)	(GA30: ME, SG/GA50: ME, SG)
	3-864-837-41	MANUAL, INSTRUCTION(URDU)	(GA30: ME, SG/GA50: ME, SG)
	3-864-837-51	MANUAL, INSTRUCTION(RUSSIAN)	(GA30: PS,SG/GA50: PS,SG)
	3-864-838-11	MANUAL, INSTRUCTION(ENGLISH)(GA77K: PL)	
	3-864-918-11	MANUAL, INSTRUCTION(ENGLISH)(PH99)	
	3-864-918-21	MANUAL, INSTRUCTION(RUSSIAN)(PH99)	
	3-864-919-11	MANUAL, INSTRUCTION(ENGLISH)(P66)	
	3-864-919-21	MANUAL, INSTRUCTION(RUSSIAN) (P66)	
	3-864-921-11	MANUAL, INSTRUCTION(ENGLISH)	(GF99K: PL)
	3-865-418-11	MANUAL, INSTRUCTION(ENGLISH)	(GA70K: TK/GA77K: TK)
	3-865-419-11	MANUAL, INSTRUCTION(ENGLISH)	(GF90K: TK/GF99K: TK)
	3-865-506-11	MANUAL, INSTRUCTION(ENGLISH)	(GA30: TK/GA50: TK)
	3-865-508-11	MANUAL, INSTRUCTION(ENGLISH)	(GF80: TK)
*	3-961-581-01	SHEET, PROTECTION	

****
HARDWARE LIST
****

#1	7-685-648-79	SCREW +BVTP	3X12 TYPE2 IT-3
#701	7-685-646-79	SCREW +BVTP	3X8 TYPE2 IT-3
#702	7-682-147-01	SCREW +P 3X6	
#703	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-921-699-11

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Home A&V Products Company

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